

**Physicians' Communication Behavior in Pediatric Context:
Investigating Parents' Proximal Outcomes**

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1. Introduction

Man, you don't have to play a whole lot of notes.

You just have to play the pretty ones.

Trumpeter Miles Davis

This quote from the renowned musician and composer Miles Davis reflected his personal approach towards music, which not only revolutionized jazz music, but music in general. Besides his technical ability, he distinguished himself as an improviser that knew exactly which note to play at the right time, thus making each piece he played a unique musical experience for the listener.

Often, the medical practice and relationship between physicians and patients is compared to jazz music (Haidet, 2007). As Shaughnessy and colleagues state it:

Music is an apt metaphor for the practice of medicine. The best medical practice, like the best music, melds technical skill and expertise with individual artistry. The new paradigm of evidence-based medicine and the apparently conflicting concept of clinical experience represent these 2 aspects of medicine. To many physicians, evidence-based medicine seems rigid, highly structured, and uninspiring - as stilted and regimented as a poorly performed Bach fugue. In contrast, economists, academics, and health authorities view the enigmatic and seemingly unpredictable use of clinical experience as analogous to punk rock: uncontrollable, chaotic, and obeying few rules.

The best medical practice is similar to neither baroque nor grunge music; instead, it is like good jazz, combining technical mastery with the artistry of focused personal improvisation. Clinical jazz combines the structure supplied by patient-oriented evidence with the physician's clinical experience to manage situations of uncertainty, instability, uniqueness, and conflicting values. (Shaughnessy, Slawson, & Becker, 1998, p. 425)

The comparison of the physicians' clinical practice with jazz music is a risky affair, as this may give the impression that physicians are encouraged to engage in hazardous and experimental behaviors at the cost of the patient. But this is not the case. Rather, the above-mentioned statement illustrates two important aspects of medical care, that are well described by Paul Haidet (2007, p.168):

Physicians who focus on only a fixed set of questions or follow the same sequence of inquiry for every patient will miss opportunities to hear the patient's perspective, build partnerships, and bring their own selves to the work of patient care. Physicians must be skilled improvisers, able to efficiently explore the unique aspects of a patient's illness and communicate in a way that is in harmony with that patient's style, all while managing the tension between new territory and the established patterns inherent in their communicative and clinical training.

Exploring the patients' world and communicating in a way that fits best the patients' needs and preferences is mirrored in the concept of patient centered communication. This concept has become a central element of high quality health care (Epstein et al., 2005), and is receiving increased attention in health care communication research (Street, Cox, Kallen, & Suarez-Almazor, 2012). The underlying rationale is that physicians engage in a variety of communicative acts that not only reflect evidence-based practice, but also need to be adapted to the uniqueness and individual needs of the person requiring medical care.

Research in health care communication has evidenced a variety of beneficial effects of physicians' effective communication behavior on patient outcomes, including satisfaction (Beck, Daughtridge, & Sloane, 2002; Buller & Buller, 1987; DiMatteo, Taranta, Friedman, & Prince, 1980), compliance and adherence to medical treatment (Burgers, Beukeboom, & Sparks, 2012; Ha & Longnecker, 2010; Hall, Roter, & Katz, 1988), better adjustment to illness (Arora, 2003), lowered distress (Fogarty, Curbow, Wingard, McDonnell, & Somerfield, 1999; Roter et al., 1995) and disclosure of concerns (Maguire, Faulkner, Booth, Elliott, & Hillier, 1996). Albeit these positive advancements, research in health care communication has predominantly focused on the physician-patient dyad. But often, health care interactions involve more than two participants. This is for example the case in the pediatric context, where parents come to the consultation for their child's illness (Bensing, van Dulmen, & Tates, 2003).

1.1. Studying parents in the pediatric context

The pediatric setting differs from the classical physician-patient interaction, as it occurs within the context of the family system involving the child and the parent (Nikendei et al., 2011), where both may yield important roles (Cohen & Wamboldt, 2000). Thus, physicians are challenged to take parents' needs into account in addition to the needs of the child. Although the child as patient is the primary target of the medical visit, his involvement is rather small and age-dependent (Tates & Meeuwesen, 2001). Parents, therefore, remain physicians' primary conversational partners during the medical encounter. Furthermore, the child's health improvement and recovery depend as well on parents' implication and adherence to the treatment plan established by the physician (Hart, Drotar, Gori, & Lewin, 2006; Waisman et al., 2003). Furthermore, parents and family members are the closest people in a child's life, and a main source of support during such a difficult life period (Saleeba, 2008). Parents know the needs and expectations of their child during illness best, especially if the child needs to be hospitalized.

In the pediatric setting, communication research has received less attention compared to the traditional physician-patient context (Ammentorp, Mainz, & Sabroe, 2005; Cohen & Wamboldt, 2000; Levetown, 2008; Nikendei et al., 2011), and little is known about physicians' communication behaviors that are related to parental outcomes. Communication behaviors examined in the pediatric context are limited to physicians' instrumental and affective behaviors (Wasserman, Inui, Barriatua, Carter, & Lippincott, 1984) and mainly related to parental satisfaction (Hatcher & Richtsmeier, 1990; Jessee, Nagy, & Downs, 2001; Lew, Lalwani, & Palermo, 2010; Lewis, Scott, Pantell, & Wolf, 1986; Magaret, Clark, Warden, Magnusson, & Hedges, 2002; Swedlund, Schumacher, Young, & Cox, 2012). Some studies have focused on parents' adherence to treatment recommendations, and discussion of psychosocial concerns (Hart, Kelleher, Drotar, & Scholle, 2007; Nobile & Drotar, 2003). Another outcome that has received attention in relationship with physicians' medical jargon use (Waisman et al., 2003) is parental understanding and recall of medical information (Grover, Berkowitz, & Lewis, 1994). The necessity of studying parents in health care communication becomes obvious given the poor knowledge and scarcity of research, but also because communication between parents and health care professionals is not optimal (Hart et al., 2006). Parents are often dissatisfied with their child's health care experience (Fisher & Broome, 2011), and this may be attributed to the poor communication of healthcare professionals (Studdert et al., 2003), or emanate from discrepancies in parents' and

physicians' attitudes and expectations concerning the medical visit and the child's care (Hart et al., 2006).

In contrast to the child and the classical patient, parents' perceptions and affective experiences are not directly related to personal physical threat, but primarily affected by multiple demands and concerns elicited by the child's illness. Thus, although parents play an important role in communicating with the physician, supporting the child and contributing to its health care, their personal stress and strain increases as the care giving burden accumulates and interferes with everyday personal and family functioning (Major, 2003). As a consequence, parental resources are taxed and their well-being and health are affected as well. This requires of parents to adapt their behaviors and apply appropriate coping strategies in order to handle the situation (Carver & Scheier, 1999; Lazarus & Folkman, 1984).

In this thesis, I suggest that the medical encounter represents an important event and resource for parents fostering positive outcomes. These outcomes, in turn, are beneficial for the child's health, as they may for example promote parents' adherence to the medical treatment, but as well help parents better adapt to the multiple demands and concerns elicited by the child's illness.

Thus, the aim of this thesis is to investigate physicians' communication behaviors that are susceptible to influence important proximal outcomes in parents during the medical encounter. These behaviors, on the other hand, may lead to long-term outcomes that not only affect the child's health, but may foster parents' self-regulatory capacities as well. The current chapter serves as the theoretical embedding on which this work and research questions are built on. Based on an empirical study, the following chapter presents three papers that investigate my articulated research questions, conceived as manuscripts and presented according to the guidelines of the journal in which they have been published or to which they will be submitted. Chapter three will summarize and integrate the findings of the papers, discuss practical implications and provide suggestions for future research.

1.1.1. Childhood illness and parental self-regulation

The rationale of this thesis is embedded in the context of self-regulation theory. This approach places the medical encounter in a broader perspective, and accentuates the thesis' contribution with regards to the demands that parents have to face and cope with during childhood illness.

The concept of self-regulation, as postulated by Carver and Scheier (1999; 2001), is viewed as a process by which individuals pursue and attain desired goals or conditions. Personal goals are therefore at the center of self-regulation, as these motivate human behavior, direct activities and consequently structure peoples' life on a short and long-term basis (Carver & Scheier, 2001; Wrosh, Scheier, Miller & Carver, 2012). Consequently, self-regulatory capacities contribute to adaptive behaviors (Carver & Scheier, 1999; 2001; Mann, de Ridder, & Fujita, 2013), enhance subjective well-being as well as physical health (Baumeister & Vohs, 2007; Wrosch, Scheier, Miller & Carver, 2012). In this context, personal health, as well as the health of family members is an important value (Bowling, 1994) that contributes to the flourishing of personal and family well-being (Lavee, McCubbin, & Olson, 1987; Ryff & Keyes, 1995; Ryff & Singer, 2000).

Individuals may engage in many self-regulatory efforts in order to sustain good health, mainly in keeping positive lifestyle habits including healthy nutrition, physical activity, abstinence from smoking or adequate stress management (Bandura, 2005; Scheier & Carver, 2003). This is also the case for parents who engage in various child-related behaviors, ranging from hygiene practices, healthy and regular nutrition to using a car seat for the children when driving (Yoo, Slack, & Holl, 2010), in order to ensure the child's health and protection (Kai, 1996). Even if parents exert a certain amount of control over their own health and the health of their family, external events like the illness of a child may interfere with their goal of sustained health. From a stress-theoretical perspective, such situations where important goals are at stake and impede goal attainment are perceived as stressful and require an appropriate response from the parent (Folkman & Lazarus, 1985; Lazarus & Folkman, 1984). The illness of a child places parents in a position of weakness, because they face a plethora of questions and concerns that are outside of their realm of competency (Kai, 1996). Consequently, parents' usual self-regulatory strategies are no longer sufficient to face the problem and require additional effort and resources to overcome the goal hindrance generated by the child's illness.

Taking a closer look at the healthcare literature, the illness of a child is a disruptive event eliciting concerns both in the child and parents (Jessee et al., 2001). According to Fernandez-Castillo and colleagues (Fernández-Castillo, Vílchez-Lara, & López-Naranjo, 2012), concerns affecting parents may be related to the disease itself, including the child's symptoms and physical condition as well as the severity of the situation. Another concern relates to the treatment and care received, which may embed clinical interventions,

information about the patient, and aspects related to hospitalization. Furthermore, concerns may also be attributed to the alteration of parental roles and, in case of hospitalization of the child, the parents' role at the hospital (Hallström, Runesson, & Elander, 2002). Consequently, parents' attention is inevitably absorbed by such a situation, requiring to engage in illness-related activities that need to be integrated into existing daily family and work routines (Streisand, Kazak, & Tercyak, 2003). These supplemental demands may be challenging, as these impair parental self-regulation of effective day-to-day functioning (Carver & Scheier, 1999) and interfere with domains relating to home, work and social relationships (Moskowitz, Shmueli Blumberg, Acree, & Folkman, 2012).

Caring for the sick child and providing adequate emotional support requires time and attention that is not available for siblings and other family members (Hopia, Tomlinson, Paavilainen, & Astedt-Kurki, 2005; Streisand, Braniecki, Tercyak, & Kazak, 2001). This time consuming aspect compels parents to seek alternative arrangements, for example housekeeping, support for siblings and other home-related obligations (Last & Grootenhuis, 1998). For working parents, reorganization of their time may also imply modulation of their work hours, or taking a day or week off from work (Witt & DeLeire, 2009). In cases where the child's illness is chronic, parents may even accept career loss in order to provide the adequate care to their child (Gravelle, 2008; Rasmussen, Wrosch, Scheier, & Carver, 2006). Marital functioning may be affected as well. For example, couples experience greater marital role strain, have difficulties accepting role changes and communicating with their spouses, resulting in fewer positive and supportive interactions (Da Silva, Jacob, & Nascimento, 2010; Quittner et al., 1998). In addition to family and work dynamics, social ties, as well as interactions with important others may likewise suffer during childhood illness (Stein & Riessman, 1980).

Besides the multiple demands they have to deal with, parents are faced with threat to their child's life and face uncertainty about the illness and recovery (Boman, Viksten, Kogner, & Samuelsson, 2004; Bonner, 2005; Hallström et al., 2002). Parents also report feeling helpless, being in a weak position and fear losing control over the situation (Hallström et al., 2002). Parents' perception of illness threat may already start by simply observing the child's symptoms or physical condition, like fever or coughing (Fernández-Castillo et al., 2012; Kai, 1996). This negative perception is even more accentuated for parents with little experience in childcare (Hansen, 1994), or with increased severity of illness (Boman et al., 2004).

In view of the multiple demands and concerns that are raised by the child's illness, parents may feel overwhelmed and lacking the necessary resources to manage this stressful situation (Lazarus & Folkman, 1984). Stressful events adversely impact the affective, bodily and behavioral system of an individual (Cohen & Wills, 1985; Viswesvaran, Sanchez, & Fisher, 1999), and a child's illness is no exception. Parents with a sick child report higher psychological distress, anxiety, depressive symptoms, and exhaustion (Miller, Cohen, & Ritchey, 2002; Streisand, Mackey, & Herge, 2009; Vrijmoet-Wiersma et al., 2008; Witt, Gottlieb, Hampton, & Litzelman, 2009). The child's illness may as well negatively affect physiological parameters in parents, such as changes in cortisol. For example, parents with chronically ill children show flatter diurnal cortisol slopes, which are a marker of a dysregulated stress response system (Miller et al., 2002).

How parents perceive and react to the situation is not only dependent on the child's illness itself, but modulated by environmental and personal factors (Moos & Schaefer, 1993). For example, ongoing life stressors like work stress may negatively contribute to parents' appraisal and make them perceive the situation more stressful. On the other hand, possessing valuable social resources like family members, friends or community may function as social support and buffer the impact of the child's illness on parents' strain (Thoits, 2011; Uchino, 2009). Personal characteristics have also the potential to influence parental appraisal and reaction to the situation (Moos & Schaefer, 1993). For example, older parents may have more experience with childhood illness and perceive it as less threatening compared to young parents. Furthermore, optimism seems to be an important personal characteristic that determines how individuals respond to illness threats. Past research suggests that optimistic individuals perceive health problems as less threatening and adopt more proactive coping strategies compared to pessimistic individuals (Scheier & Carver, 2003).

Considering all of the above, parents cannot sufficiently self-regulate anymore and experience a valuable amount of emotional and psychological distress. With this background, the encounter with the physician is of high significance for parents. In the following section, I will discuss the importance of the medical interview in the pediatric context, and the role that physicians' communication behavior may have on important parental outcomes relevant for the child's health improvement and parental self-regulation.

1.2. Importance of the medical interview

The medical interview is the primary mean through which physicians carry out their work and plays a major role for the relationship between physician and patients (Cole & Bird, 2014; Lazare, Putnam, & Lipkin, 1995). Based on previous conceptual considerations (see Cohen-Cole, 1991; Lipkin, Lazare & Putnam, 1995), Roter and Hall (2006) suggest four functions that can be attributed to the medical interview: 1) physicians gather data/collect information, 2) educate and counsel their patients, 3) respond to patients' emotions and 4) facilitate patient participation in the dialogue. Thus, the medical interview is crucial in determining the problem of the patient and proposing the appropriate treatment. As discussed previously, physicians' effective communication behaviors during the medical encounter are positively related to a number of patient outcomes, such as satisfaction or adherence to medical treatment. For parents, the medical encounter represents a significant event as well. They rely on physicians' competence and expertise concerning diagnosis, treatment, or prognosis concerning their child. Coming to the consultation, therefore, is likely to involve uncertainty and fear, since parents want to know what is happening to their child and apprehend the outcome of the medical visit.

1.3. The medical interview as stressful event

Several authors have argued that the medical visit is a specific form of interpersonal encounter that may feature stressful characteristics (Finset, Graugaard, & Holgersen, 2006; Van Dulmen & Bensing, 2002), but empirical evidence in this domain is scarce. A study of Bensing and colleagues (Bensing, Verheul, & van Dulmen, 2008) observed elevated anxiety levels in patients entering the consultation room. More suggestions can be drawn from studies investigating physiological processes occurring during the medical encounter. Although small, evidence suggests that the medical encounter may be related to psychophysiological responses in patients and physicians (Finset, 2012; Hulsman, Smets, Karemaker, & de Haes, 2011). Physiological reactions have been observed and indicate that the interview is stressful for physicians (Hulsman et al., 2010; van Dulmen, Tromp, Grosfeld, ten Cate, & Bensing, 2007), but the picture is unclear concerning patients.

It is well documented that situations involving threat and low controllability are perceived as stressful, and typically involve the activation of the hypothalamic-pituitary-

adrenal-axis (HPA) and the release of the steroid hormone cortisol (Denson, Spanovic, & Miller, 2009; Dickerson & Kemeny, 2004). In the pediatric context, the encounter with the physician may be perceived as stressful by parents because of the interactional character of the encounter itself and the child's health that is at stake. Given that existing research findings are not conclusive, Paper 1 analyzes the impact of the medical interview on parents' stress response, and investigates if the encounter with the physician is an event stressful enough to elicit a cortisol response in parents.

1.3.1. Physicians' affective communication behavior

Stressful features related to the medical encounter, like uncertainty and lack of information, accentuate parents' dependence on physicians' expertise and communication regarding the diagnosis, treatment and prognosis of the child's illness. This may explain why parents place much importance on physicians' supportive communication during the medical visit (Bradford, Roedl, Christopher, & Farrell, 2012a; Coulson, Buchanan, & Aubeeluck, 2007), and report assistance with family and social support as their greatest unmet need during the illness of their child (Levetown, 2008). Physicians' transmission of information and communication behavior is therefore crucial to the medical encounter, and may function as social support (Street, Makoul, Arora, & Epstein, 2009).

Especially physicians' affective communication has been suggested to be effective in situations that are characterized by threat and low controllability (Uchino, Cacioppo, & Kiecolt-Glaser, 1996), as it might buffer the stress response in parents elicited by the medical encounter (Bensing & Verheul, 2010). Adopting a warm and compassionate communication style may encourage a reappraisal of the situation (Cohen & Wills, 1985), enhance parental self-esteem and self-efficacy to face challenging situations in the future, and increase their trust in the physician (Bensing, Schreurs, & De Rijk, 1995; Schwarzer & Knoll, 2007). The reduction of the stress response in parents plays an important role to their perception of the child's illness and recovery prognosis. In addition, stress reduction is also related to improved well-being and increased positive affect, which may prevent further distress and help generate personal resources in the longer term (Fredrickson, 2000; Garland et al., 2010).

Until now, there has been no effort to investigate the effects of physicians' affective communication behavior on parental stress experienced during the medical encounter. The

few studies available have been conducted with adult patients and suggest that empathic statements may lower distress in patients (Fogarty et al., 1999) and their autonomic activity during the medical encounter (Sep, van Osch, van Vliet, Smets, & Bensing, 2014). Thus, in addition to measuring parents' stress during the medical visit, Paper 1 analyzes if physicians' affective communication behavior is able to attenuate this stress response in parents.

1.4. Physicians' negative word use and parents' positive affect

During the medical encounter, the modalities and valences through which physicians convey their communication are important as well. To this effect, physicians' language use has not received much attention in the literature, but is thought to influence patients' perceptions during the medical visit (Cyna & Lang, 2010; Häuser, Hansen, & Enck, 2012; Heritage, Robinson, Elliott, Beckett, & Wilkes, 2007; Lang et al., 2005). Especially, employing words with negative emotional valence seem to adversely affect patient outcomes. For example, patients undergoing medical procedures reported higher levels of pain and distress when physicians employed phrases containing words with negative emotional content, like "sting" or "burn", compared to patients in the control group (Lang et al., 2005). In the pediatric context, parents do not undergo medical procedures and their involvement is rather limited to verbal interactions with the physician. It is therefore interesting to investigate if the same underlying mechanisms would apply to parents during the medical visit.

Words do impact social interactions (Pennebaker, Mehl, & Niederhoffer, 2003), it is therefore legitimate to assume that physicians' negative word use may adversely relate to parents' affective experiences during the medical encounter. To this effect, focusing on parents' positive emotions is of special interest. The reason lies in the critical role that positive emotions play for emotion regulation. Research in this domain has evidenced that positive emotions undo the aftereffects of negative emotions and build enduring personal resources (Fredrickson, 2000; Garland et al., 2010). Interestingly, no study has attempted to focus on patients' or parents' positive moods during the medical encounter. Finset and Mjaaland (2009) have noticed this drawback in health care research and advocate that physicians foster positive emotions in patients and thus actively engage in assisting their affect-regulation. Investigating communication behaviors that may influence positive emotions of parents are therefore of great utility in health care communication, as these are beneficial for parents in the short and long term. To answer this question, one goal of Paper 2

is to investigate if physicians' negative word use is negatively related to parents' positive mood during the medical visit.

1.4.1. Affect-dependent satisfaction with care

Affective states are not only important for parents' well-being, but may also contribute as to how they evaluate the quality of care received. It is known that satisfaction ratings depend mainly on the patient level, and several individual characteristics like age, gender, health status and expectations have been identified so far (Bjertnaes, Sjetne, & Iversen, 2011, Crow et. al, 2002). Individuals' temporary affect as a source of variation in satisfaction ratings has not been investigated in healthcare communication, but is known to serve as a basis for the formation of evaluative judgments (Forgas, 2008) and has been applied to consumer satisfaction (Oliver, 1980; 1993) and job satisfaction (Judge & Ilies, 2004; Scott & Judge, 2006). In the health care setting, patient satisfaction is thought to involve cognitive and affective components, reflecting therefore the subjective nature of the evaluation (Gill & White, 2009). Thus, Paper 2 pursues two further goals. It investigates if parents' momentary positive mood is related to their evaluation of the medical visit, and analyzes if part of the variation in satisfaction ratings is related to physicians' negative word use.

1.5. Importance of parents' satisfaction and recall of medical information

1.5.1. Satisfaction

An important consequence of parental satisfaction with the medical visit is their compliance and adherence to the treatment plan established by the physician (Lewis et al., 1986). Parental adherence is a significant topic in health care, as patients or parents' noncompliance has negative consequences on a variety of domains. Noncompliant patients do not fully benefit of the medical treatment, and consequently have poor health outcomes, lower quality of care and increased health care costs (van Dulmen et al., 2007). Adherence to medical treatment is even more critical in chronic disease, because of the long-term aspect of disease-management and its impact on daily activities. Improving adherence in the pediatric context is especially important, the impact on children's health outcomes seems to be stronger compared to adults (DiMatteo, Giordani, Lepper, & Croghan, 2002). In fact, the meta-analytic

review of DiMatteo and colleagues (DiMatteo et al., 2002) reports that non-adherence in the pediatric setting may compromise the health benefits of treatment by 71%. Thus, parents' adherence to the treatment plan will affect long-term outcomes in their children like symptom resolution and improved health (Stewart, 1995). While parents participate in improving the health of their child, this is also effective in reducing their uncertainty and distress, as they may observe improvements in their child's health status and establish a sense of mastery over the illness.

1.5.2. Recall of medical information

Parental recall of medical information is another important outcome for parents and patients in general. Besides being related to satisfaction, it is also associated with better compliance and adherence to medical treatment, (Kessels, 2003; Watson & McKinstry, 2009; Zeng-Treitler, Kim, & Hunter, 2007). Furthermore, patients' better recall also improves their disease management and decreases anxiety (van der Meulen, Jansen, van Dulmen, Bensing, & van Weert, 2008).

Albeit its importance, past research has shown that patients' recall of medical information is not optimal (Watson & McKinstry, 2009). Kessels (2003) reports that patients immediately forget 40 to 80% of the information received during the medical encounter, and half of the information remembered is incorrect. Studies investigating parental recall do not depict a better situation. Dawson and colleagues (Dawson, Taylor, Williams, Taylor, & Brown, 2014) report that parents only recall 39% of the information received when asked two weeks after the medical visit. Recall right after the medical encounter is generally higher, but still not optimal. Waisman and colleagues (2003) report parents to recall 80% of the type, frequency and duration of the medication received, without asking them about the name and dosage of medication. A study from Bayldon and colleagues (Bayldon, Glusman, Fortuna, Ariza, & Binns, 2013) revealed that parents were able to name 71% of the medication prescribed by the physician, but only 37% recalled the medication instructions received. The reasons for poor recall in patients or parents have been studied to some extent (see Kessels, 2003; Watson & McKinstry, 2009), and may depend on aspects related to the physician (e.g. medical jargon use), how the information is transmitted (e.g. verbal vs. written) or to aspects related to the patient (e.g. education).

In the next section, I will propose two communication behaviors - physicians' speech complexity and interrupting behavior - that have not been investigated in conjunction with parents' satisfaction and recall of medical information, and discuss their importance for the mentioned outcomes.

1.5.3. Physicians' speech complexity

Physicians' speech complexity has received little attention in general health care communication, and the pediatric context is no exception. This is surprising, as parents expect health information to be of high quality, and provided in an effective and efficient manner (Fisher & Broome, 2011; Levetown, 2008). Furthermore, physicians' clear and comprehensible language is critical for parent's understanding, recall and satisfaction (Brown & Wissow, 2008; Selic, Svab, Repolusk, & Gucek, 2010).

Physicians possess more knowledge and expertise compared to patients or parents, and they may use complex speech as a means to control the course of the medical visit (Sakai & Carpenter, 2011). For example, physicians' employment of medical jargon is often used as a marker of complex speech, and associated with physicians' dominance behavior (Schmid Mast, 2003; Schmid Mast, Hall, Klöckner Cronauer, & Cousin, 2011). This may affect parents in different ways. It may inhibit parents to ask questions, and consequently stop the communication process (Jessee et al., 2001). This behavior clearly counteracts parents' expectations (Hallström et al., 2002; Levetown, 2008) to receive information in a clear and simple way. Consequently, parents' satisfaction may be negatively affected. Furthermore, complex speech is known to tax memory and processing capacities (Ley, 1979; Wingfield et al., 2003), and thus impedes parents' retention of medical information (Jackson, 1992).

Past research on physicians' complexity of language has predominantly focused on medical-jargon use or readability of written health information (Freed et al., 2013; Howard, Jacobson, & Kripalani, 2013; Jackson, 1992; van Weert et al., 2010; Wilson & Wolf, 2009), but physicians' speech complexity in terms of syntactic and semantic complexity has rarely been studied (Bradshaw et al., 1975; Ley, 1979). Therefore, Paper 3 investigates to what extent physicians' speech complexity, in terms of syntactic and semantic complexity, relates to parental satisfaction and recall of medical information

1.5.4. *Physicians' interrupting behavior*

Studies investigating physicians' interruptions have overall been descriptive in nature. Physicians tend to interrupt patients already during the first minute of talk (Beckman & Frankel, 1984; Marvel, Epstein, Flowers, & Beckman, 1999; Rhoades, McFarland, Finch, & Johnson, 2001), and use more non-supportive interruptions compared to patients (Li, Krysko, Desroches, & Deagle, 2004; Menz & Al-Roubaie, 2008). Differences in frequencies of interruptions are not coherent across studies. Street and Buller (1988) and Li (2001) found no differences in amounts of interruptions. A study from West (1984) found physicians to interrupt more than patients, whereas Arntson, Droge and Fassl (1978) as well as Irish and Hall (1995) reported a reversed pattern of interrupting behavior during the medical visit. These ambivalent findings may be attributed to the different definitions being used for investigating interruptions (Li et al., 2004).

The above findings have laid out a foundation for the study of interruptions, but do not show if and how physicians' interruptions affect patient outcomes. The only study that has linked physicians interrupting behavior to patient outcomes shows that physicians' overall interruptions negatively affect patients' satisfaction with the medical visit (Hall, Irish, Roter, Ehrlich, & Miller, 1994). However, the authors did not distinguish between various styles of interruptions, which may differentially affect patient outcomes. Li et al. (2004) argue that interruptions are more a question of style rather than of frequency, and consequently propose to conceptualize interruptions into supportive and non-supportive ones.

According to Li et al. (2004), supportive interruptions aim to bring clarification and foster the information exchange between physician and patient, and thus uphold the conversation initiated by the parent. These characteristics are consistent with physicians' communication behaviors commonly designated as affiliative (see Buller & Buller, 1987; Kiesler & Auerbach, 2003). The goal of such behavior is to establish and maintain a good relationship with the patient. The opposite is applicable for non-supportive interruptions. These may be employed to control the course of the medical visit and interfere with the conversational flow, and thus reflect physicians' dominance during the medical encounter (Schmid Mast et al., 2011). Affiliative behaviors are associated with increased satisfaction both in patients and parents (Beck et al., 2002; Swedlund et al., 2012), as well as recall of medical information in patients (Hall et al., 1988; Roter, Hall, & Katz, 1987). In contrast, physicians' dominant behavior negatively relates to patients' satisfaction and recall of

medical information (Hall et al., 1988; Roter et al., 1987). Based on these considerations, Paper 3 investigates the influence of physicians' interruptions - supportive and non-supportive – on parents' satisfaction and recall of medical information.

1.6. Summary of research questions

In my thesis, several research questions are investigated. In the following, I will summarize the research questions that will be addressed in the 3 papers presented in the following chapter.

Paper 1: Does the medical encounter represent a stressful event eliciting a psychophysiological response in parents in form of an increase in cortisol? Is physicians' affective communication behavior effective in attenuating this stress response in parents during the medical encounter?

Paper 2: Does physicians' negative word use decrease parents' positive affect as well as their satisfaction with the medical encounter? Does parents' positive affect mediate the relationship between physicians' negative word use and parents' satisfaction?

Paper 3: Is physicians' speech complexity negatively related to parental recall of medical information and parental satisfaction with the medical visit?

Do physicians' interruptions negatively affect parental recall of medical information and parental satisfaction with the medical visit? Specifically, do supportive interruptions positively affect parental recall of medical information and parental satisfaction with the medical visit? Do non-supportive interruptions negatively affect parental recall of medical information and parental satisfaction with the medical visit?

2. Overview of Papers

Paper 1: Physicians' affective communication behavior attenuates parents' stress response during the medical interview

Abstract

Objective

To investigate whether the medical interview in the pediatric context generates a stressful response in parents in form of heightened cortisol activity, and whether pediatricians' empathetic communication is able to attenuate this stress response.

Methods

68 parents were recruited at pediatric out-patient and in-patient consultations. Salivary samples were collected between 60 and 30 minutes prior to the consultation, shortly before the consultation, 20 minutes as well as 45 minutes after the consultation. 19 pediatricians participated in the study and effectuated the medical visit as usual. We videotaped the consultations and coded pediatricians' affective communication using the RIAS and the Four Habits Coding Scheme.

Results

Parents' cortisol increased during the medical visit with a peak at 20 minutes after the medical encounter. Furthermore, multilevel analysis revealed a lesser increase in parents' cortisol response associated with pediatricians' levels in supportive communication behaviors.

Conclusion

As indicated by their humoral stress responses, the medical encounter was stressful for the parents. Pediatricians' affective communication modulated this stress response in that more supportive communication was related to smaller cortisol increases. Pediatricians' affective communication behavior during the medical visit can alleviate parents' distress and anxiety, representing a source of social and emotional support.

Paper 2: Pediatric Consultations: Negative-Word Use and Parent Satisfaction

Abstract

Objective

This study investigates the impact of pediatricians' negative-word use on parents' affective quality and satisfaction judgments during the medical encounter.

Methods

In total, 68 medical consultations were videotaped and pediatricians' communication transcribed for analysis. We employed the Linguistic Inquiry and Word Count application in order to measure the amount of negative words used by the pediatrician. Parents rated their momentary mood as well as their satisfaction at the end of the encounter.

Results

Pediatricians' negative-word use was negatively linked to parents' affect quality, but not with the satisfaction ratings after the medical visit. Although there was no direct effect, our results revealed an indirect effect of pediatricians' negative-word use on parents' satisfaction via parents' mood.

Conclusions

The results point to the negative impact that words employed during the medical encounter can have on individuals in need of care. Consequently, this is relevant for clinical training and practice.

Paper 3: Physicians' speech complexity and interrupting behavior in pediatric consultations

Abstract

Objective

Physicians' communication behavior is an essential aspect of the medical visit in the pediatric context, affecting a variety of outcomes both in child and parents. So far, little attention has been given to physicians' speech complexity and interrupting behavior, and this study analyzes how these behaviors relate to parents' recall of medical information as well as satisfaction with the medical visit.

Methods

Participants in our study were 19 physicians and 68 parents recruited at pediatric outpatient and inpatient consultations. The medical interaction was videotaped and analyzed in order to assess physicians' speech complexity and interrupting behavior. At the end of the encounter, parents filled out two questionnaires in order to assess their satisfaction with the medical visit and their recall of medical information.

Results

Our results evidence that recall of medical information is negatively associated with physicians' interrupting behavior for parents reporting low positive mood, but not with physicians' speech complexity. We also found lower educated parents to report less satisfaction the more complex language physicians employed. Furthermore, parents' satisfaction was negatively associated with physicians' interrupting behavior, especially when displayed by male physicians.

Conclusions

These findings emphasize the importance of physicians' communication behavior in the pediatric context, and recommend that physicians employ comprehensible language when talking with parents. Furthermore, physicians should interrupt rarely during the medical encounter, and if they do, then with positive involvement.

2.1. Paper 1

Physicians' affective communication behavior attenuates parents' stress response during the medical interview

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Abstract

Objective: To investigate whether the medical interview in the pediatric context generates a stressful response in parents in form of heightened cortisol activity, and whether pediatricians' empathetic communication is able to attenuate this stress response.

Methods: 68 parents were recruited at pediatric out-patient and in-patient consultations. Salivary samples were collected between 60 and 30 minutes prior to the consultation, shortly before the consultation, 20 minutes as well as 45 minutes after the consultation. 19 pediatricians participated in the study and effectuated the medical visit as usual. We videotaped the consultations and coded pediatricians' affective communication using the RIAS and the Four Habits Coding Scheme.

Results: Parents' cortisol increased during the medical visit with a peak at 20 minutes after the medical encounter. Furthermore, multilevel analysis revealed a lesser increase in parents' cortisol response associated with pediatricians' levels in supportive communication behaviors.

Conclusion: As indicated by their humoral stress responses, the medical encounter was stressful for the parents. Pediatricians' affective communication modulated this stress response in that more supportive communication was related to smaller cortisol increases.

Practice Implication: Pediatricians' affective communication behavior during the medical visit can alleviate parents' distress and anxiety, representing a source of social and emotional support.

Keywords: Physician-patient relations; Empathetic communication; Cortisol; Social support

Introduction

The medical interview serves an important function in medical care, because it serves to determine the problem of the patient, to create and sustain a therapeutic relationship and to implement a consequent treatment plan [1]. Although the quality of the medical interaction can influence a number of physiological and psychosocial aspects of patients' health [2-4], it is suggested that the encounter with the physician may as well represent a stressful experience involving stress-related physiological changes [5]. In fact, a number of studies found autonomic activity in patients in response to the medical interview [6].

Besides eliciting cardiovascular activity, a parallel response to stressful situations is a cascade from negative emotions to the activation of the different elements of the hypothalamic-pituitary-adrenal-axis (HPA) with the release of the steroid hormone cortisol being the final outcome [7]. The few studies examining adrenocortical activity in association with the medical interview evidence heightened cortisol activity in medical students conducting simulated consultations [8,9], but no association has been established so far in patients involved in arranged consultations [10]. Given the scarcity of research in this domain, our study aims at filling this gap by observing real medical visits involving parents in pediatric consultations.

The child's sickness can be a threatening event for parents and talking to the pediatrician is often anticipated with apprehension [11]. Thus, we expect that the stressful characteristics of the consultation most likely trigger a strain response in parents, in form of adrenocortical activity. At the same time, this stressful process can be modulated by pediatricians' affective communication. Pediatricians' emotional support is a resource that may help parents perceive the situation as less threatening and more controllable [12], and may in turn be effective in reducing their physiological strain [13].

1.1. Medical interview in pediatric setting

Threats to the well-being of a child are stressful for parents and the whole family, especially if the illness proves to be severe or chronic. Parental concerns may relate to the child's disease, aspects of the treatment and care it will receive, as well as to the alteration of parental roles [14] and involve impairments in parents' psychological and physiological well-being. Empirical evidence for illnesses in the minor and moderate ranges are lacking, but parents whose children have severe illnesses such as cancer show higher psychological strain and cortisol levels than those with healthy children [15,16].

Given the multiple demands and concerns elicited by the child's illness, the encounter with the pediatrician represents a significant event for parents. Confronted with harm to their beloved child, they rely on the expertise and experience of the physician concerning the child's diagnosis, treatment, or prognosis. Thus, anticipating the medical interaction is often afflicted with uncertainty and fear since parents expect to receive new information, particularly bad one. Furthermore, the demands of the interaction itself may elicit physiological activity in parents [5]. Specifically, they may feel distressed with regard to the number and importance of topics discussed [5,17]. Ultimately, differences in status and power may underline parents' unease, and not leave much room for them to exert control, entailing a feeling of powerlessness [5].

Situations that threaten central goals and are characterized by low controllability are perceived as stressful. Besides involving negative affective states, like anxious mood and agitation [18-21], such situations induce a cascade of cardiovascular and endocrine responses, particularly the release of cortisol [7]. The hormone cortisol, a glucocorticoid secreted from the adrenal cortex, is involved in normal physiological functioning, and helps the body adapt to increased demands and challenges placed on the organism [22]. Prolonged, repeated, or

increased HPA activity, however, may favor negative physical and mental health outcomes [23].

The related burden of a child's accident or chronic condition may already involve high levels of parental strain, leaving only limited room for further cortisol increases following the medical interview [19,21,24,25]. The anticipation of the visit would have to elicit HPA activity in addition to the elevated cortisol levels upon arrival. Based on our argumentation above, we expect the specific features of the encounter, namely threat and lack of control, to be sufficiently strong to elicit an endocrine stress response in parents above and beyond stressful events experienced during the day.

Hypothesis 1: The parents' level of free cortisol will increase during the medical encounter.

1.2. Affective Communication

Physicians' affective communication has a supportive function [26] particularly effective in situations where individuals lack control [27]. It therefore constitutes a supplemental psychosocial resource for patients and their families [28]. Typical behaviors include empathetic expressions and reassuring words [5,29], but a significant portion is conveyed through physicians' nonverbal cues and the positive atmosphere created [30,31]. Despite its importance, supportive behaviors account only for a minor part of the duration of medical consultations [32], especially emotionally supportive behaviors [33].

Physician's affective communication is a form of emotional support that can have direct and indirect effects on the stress process [34]. Social and emotional support decrease the negative reactions to the stressful situation via a direct effect on physiological activity or through encouraging a reappraisal of the situation [13]. Because emotionally distressing events have their origin in the individual's evaluation of the circumstances, a comforting and warm communication is effective in motivating constructive appraisal patterns that foster positive emotions [35], especially in situations that are threatening or restricting control [36].

Positive emotions, in turn, are effective to counter the negative effects of stress [37]. Also, individuals may feel valued and understood, which can enhance their self-esteem and trust in the physician [17]. To be effective, the support received does not have to be perceived by the recipient [38].

In summary, emotional support may represent an important coping resource for parents, which can directly influence their physiological stress response and lead parents to perceive the situation as less threatening and more controllable. Pediatricians' positive affect and supportive climate may therefore play an important role in reducing the strain elicited by the consultation.

Hypothesis 2: Pediatricians' affective communication behavior is negatively associated with parents' change in cortisol during the medical encounter

- a) Pediatricians' positive affective atmosphere is negatively related to parents' cortisol response.
- b) The verbal facets of pediatricians' affective communication are negatively related to parents' cortisol response.
- c) Pediatricians' nonverbal behavior is negatively associated with parents' cortisol response.

2. Methods

2.1. Setting and participants

The first and second author recruited participants at pediatric out-patient and in-patient consultations in two different Swiss hospitals between October 2010 and November 2013. In total, 68 parents agreed to participate in the study. The majority of the sample consisted of mothers (82.4 %), and the average age was 33.4 years ($SD = 5.29$). Participants attained slightly more compulsory (29.4 %) and tertiary education (29.4 %) compared to secondary

education (25 %; missing data, 16.2%). Children's age ranged from 2 months to 15 years, and the reasons for treatment were diverse (e.g. asthma, fever, nutritional allergies).

In total, 19 pediatricians agreed to participate in the study and were mostly female (73.5 %). The average age was 36.18 years ($SD = 9.82$), and they differed as to their position (resident, 63.2%; senior physician, 19.1%; chief physician, 17.6%) and work experience ($M = 7.15$ years, range: 0.5-28 years).

2.2. Procedure

Parents received information about the purpose and procedure of the study, as well as the planned video-recording of the consultation. After giving informed consent, parents completed a questionnaire with sociodemographic information as well as information about their smoking habits, hormonal-contraceptive use and medication intake, physical activity, and food consumption. The consultation took place according to the routines with the only difference being its being video-recorded for the purpose of analyzing pediatricians' affective communication. Pediatricians and parents received no specific instructions, and were unaware of the tested hypotheses. We took salivary cortisol samples of the participating parents before and after the consultation (see section 2.4.2 for details).

2.3. Ethical considerations

This study received approval from the Human Research Ethics Committees of the Cantons of Vaud and Fribourg in Switzerland.

2.4. Measures

2.4.1. Affective Communication Behavior

Rating of global affective impression created by physician. We used four items of the Global Affect Rating Scale of the Roter Interaction Analysis System (RIAS, [39]) to measure the affective atmosphere of the consultation. The RIAS is a widely used instrument for

assessing communication in medical context, and has demonstrated reliability and validity in various studies [39]. The Global Affect Ratings are additional dimensions of the RIAS that capture the emotional climate of the entire conversation and include the subjective ratings of general impressions concerning affective characteristics of the speakers based rather on vocal qualities than verbal content. Two independent observers rated the dimensions “friendliness/warmth”, “interest/attentiveness”, “responsiveness/engagement” and “sympathetic/empathetic” on a five-point Likert scale (1 = lowest and 5 = highest; ICCs ranged from .65 to .75). In a second step, we summed up the scores of each individual dimension to form a global score.

Verbal affective behavior. Using the RIAS, physician-patient dialogue can be coded into predefined categories based on communication units defined as utterances, which represent the “smallest unit of expression or statement to which a meaningful code can be assigned” [39, p. 35]. The predefined categories are generally viewed as reflecting socio-emotional and task-focused aspects of medical talk, and in order to measure verbal facets of pediatricians’ affective behavior, we aggregated affective RIAS codes from the socio-emotional cluster into a composite measure including the categories “personal remarks”, “empathetic expressions” and “reassuring statements”. The interrater reliability for this composite reached .84.

Nonverbal Behavior. We measured pediatrician’s nonverbal behavior using one item from the Four Habits Coding Scheme [40]. This instrument is used to describe and evaluate physicians’ effective behavior in the clinical setting. The categories are more broadly defined than the ones from RIAS and observers have to give their evaluation on 5-point likert scales. We took one item from habit 3 (demonstrate empathy), which evaluates to what extent physicians display nonverbal behaviors that express great interest, concern and connection. This item focuses only on nonverbal behavior, whereas the remaining items from the Four Habits Coding Scheme and the items from the RIAS do not distinguish between verbal and nonverbal cues. The interrater reliability for this measure reached an ICC of .69.

2.4.2. *Free cortisol*

Salivary samples were collected using Salivettes (Sarstedt Rommelsdorf, Germany) on four measurement occasions to determine the levels of free cortisol. The first measurement took place between 60 and 30 minutes prior to the medical visit (t1), followed by a second measurement shortly before the medical visit (t2). The participants were asked again to give a saliva sample 20 minutes (t3) as well as 45 minutes after the medical visit (t4). The saliva samples were stored at -20°C and analyzed at the laboratory of Clinical Chemistry and Biochemistry of the University Children's Hospital Zürich (Switzerland) using electrochemiluminescence immunoassay (Cobas 3411; Roche Diagnostics, Rotkreuz, Switzerland). For our analysis, the change in level of cortisol between the first (t1) and the third measurement occasion (t3) was calculated on the basis of regressed change scores.

2.4.3. *Intervening variables*

Daytime cortisol levels are known to be influenced by a number of intervening variables. We decided to rule out some of those factors on the basis of our eligibility criteria (e.g., pregnancy or breastfeeding were exclusion criteria, [41]). Other factors that are potential confounders in ambulatory cortisol assessment were measured and introduced in our multilevel models as covariates.

Sex. Sex is one of the time-constant covariates that influence salivary cortisol secretion [41] and we therefore decided to control it statistically (men = 0, women = 1).

Age. Age-related differences in cortisol responses have been observed in experimental studies, older adults showing higher cortisol responses compared to younger adults [42]. This information was introduced in our models as well.

Hormonal contraceptive use. The use of oral contraceptives is associated with flatter diurnal cortisol curves [41]. We therefore utilized this information as a covariate (no = 0, yes = 1).

Smoking. Acute stress can increase cortisol levels as well as trigger consumption of nicotine, and therefore, smoking is regarded as a confounder [41]. We assessed the smoking habits of our participants (no = 0, yes = 1), and introduced it in our models.

Physical activity. Since acute responses to physical exercise could influence cortisol secretion [41] we computed a variable indicating whether study participants were physically active prior to the visit (no = 0, yes = 1) and included it as a covariate.

Medication. Medication is known to influence daytime cortisol levels. We assessed the medication intake (e.g. antidepressants, corticosteroid medication) of our participants (no = 0, yes = 1) and included it as a covariate.

Food intake. Daytime cortisol levels are influenced by meal intake. Ideally, the participants would be asked to abstain from food at least two hours before coming to the consultation. In our study, we assessed if the participants had important meals shortly before the medical encounter (no = 0, yes = 1).

Time of day. Because cortisol secretion undergoes diurnal variations, it is recommended to test individuals in the late afternoon because the diurnal decline slows down [42]. Due to hospital routines, our participants came to the consultation primarily in the morning, only a small proportion of consultations took place in the afternoon; we therefore included this information in our model (afternoon = 0, morning = 1).

Visit length. We included the length of the visit as a covariate, because physicians' supportive communication takes time and may in part be expressed by deliberately taking more time for a patient thus potentially lengthening the encounters. To do this, we calculated the time elapsed in minutes between the start and the end of the consultation.

2.5. Statistical analysis

In our sample, 5 parents had extreme cortisol values (more than 2 standard deviations above the mean; 6 values, 2.2%), and 6 parents had missing cortisol values (10 missing

values, 3.7%). The outliers were winsorized, whereas the missing data were replaced by the sample mean of the respective measurement occasion. Furthermore, to correct for the skewness of the cortisol distribution, we computed log-transformations of the raw cortisol data as suggested by Miller and Plessow [43].

To account for the hierarchical nature of our data (parents nested within pediatricians), we conducted multilevel analysis using HLM 7.01 [44]. We used 2-level models with level 1 including pediatricians' affective communication behaviors in the different encounters and our covariates as independent variables, and level 2 including pediatricians. Before testing our hypothesis, we first examined the amount of within- and between-individual variance concerning the outcome variable. In a second step, we calculated separate multilevel models for each affective communication measure including our covariates, in order not to overtax our models [45]¹.

3. Results

3.1. Descriptives

The length of the medical visit was shorter in the in-patient consultation ($M = 10.43$, $SD = 5.39$) as compared to the out-patient consultation ($M = 15.19$, $SD = 4.94$; $t = -3.27$, $p < .01$). Pediatrician's global affect ratings reached an average of 15.20 ($SD = 2.51$), and the composite measure of the verbal RIAS categories one of 5.72 ($SD = 3.39$). For the nonverbal behavior, pediatricians reached an average of 4.08 ($SD = 0.92$). Table 1 contains the frequencies, means, standard deviations, ranges, and intercorrelations of the relevant variables.

¹ Including all predictors in one model did not change their effect size.

3.2. Variance decomposition

Estimation of the null model revealed that 21% of variance in parents' change in cortisol is due to differences between pediatricians ($ICC(1) = 0.2182$), and may be explained by differences in pediatricians' appearance, behavior or communication style during the consultation.

3.3. Cortisol response

In line with our first hypothesis, we found an increase in parents' cortisol response in the course of the medical encounter. Figure 1 shows the means for the raw cortisol values measured on the four measurement occasions (t1-t4). The baseline measure at t1 was 12.20 nmol/l ($SD = 4.64$), and 13.28 nmol/l ($SD = 5.07$) at t2, and the measures did not differ significantly ($t = -1.08, p > .05$). As expected, the cortisol response increased during the medical visit and peaked at 20 minutes after the consultation ($M = 14.40$ nmol/l, $SD = 6.92$), followed by a subsequent decrease visible already at t4 ($M = 11.77$ nmol/l, $SD = 4.06$). The change in cortisol was significant from t1 to t3 ($t = -2.20, p < .01$), but not between t2 and t3 ($t = -1.12, p > .05$).

3.4. Affective communication behavior

Our second hypothesis predicted pediatricians' affective communication behavior to be negatively related to parent's change in cortisol during the medical visit. As expected, pediatricians' global affective climate during the consultation was associated with parents' cortisol response. The change in level of free cortisol was the smaller the higher the global affective atmosphere created by the pediatrician ($b = -.02, p < .01$). Figure 1 shows the impact of global affective atmosphere at ± 1 SD from the mean on parental cortisol.

The analysis with the second indicator of nonverbal behavior pointed in the same direction, the more pediatricians displayed nonverbal cues that expressed interest, concern, and connection towards their conversational partner, the lower increases in cortisol we

observed in parents ($b = -.03, p < .05$). Likewise, verbal facets of pediatricians' affective behavior were negatively related to parents' cortisol response, but this effect just missed statistical significance ($b = -.01, p = .05$). Hence, the three analyses show the same expected modulating effects, but only two of them reach the conventional level of statistical significance. We further measured intervening variables (sex, age, hormonal contraceptive use, smoking, physical activity, medication, food intake, time of day, and visit length) and introduced them in our models as covariates. Further details on the models as well as control variables are displayed in table 2.

4. Discussion and Conclusion

The goal of this study was to investigate parent's physiological reaction to pediatric consultations and to explore whether pediatricians' affective communication behavior would reduce stress responses during the medical visit. Based on video-recordings of the consultations, we rated pediatricians' affective communication behavior, and parents provided saliva samples several times in the course of the medical encounters. Our results indicate that the medical encounter represented a stressful event for parents as indicated by an increase in their levels of free cortisol. Pediatricians' affective communication behavior was related to less steep increases in parents' cortisol during the medical visit. The results will be discussed in detail in section 4.1., followed by a short summary and practice implication in section 4.2. and 4.3..

4.1. Discussion

As expected, parents' cortisol levels increased during the medical encounter. Peak cortisol values were observed 20 minutes after the encounter, followed by the onset of recovery visible at the measurement occasion 45 minutes after the medical visit. The magnitude of this effect is comparable to that observed in laboratory studies, where powerful

interpersonal stressors such as the Trier Social Stress Test are applied to induce a cortisol response in participants [46]. This finding enlarges existing knowledge about the effects of the medical interview on patients' physical strain [47]. So far, studies evidenced cardiovascular responses and elevated cortisol values in medical students conducting simulated consultations [8,9], whereas no cortisol response was found in patients [10], which may be due to the simulated nature of the study. In our sample, we find the medical encounter to be sufficiently stressful to elicit a cortisol response in parents. Due to the nature of our study, baseline assessment of cortisol took place on the day of the medical visit. The increase from t1 to t3 is therefore the more impressive, since parents may have arrived at the clinic with heightened cortisol levels, already.

We expected pediatricians' affective communication behaviors to benefit parents and reduce their neuroendocrine stress response. Nearly all of our affective communication measures were found to buffer parents' cortisol response during the consultation. This supports the assumption that physicians creating a positive emotional atmosphere and using appropriate verbal and nonverbal behaviors during the medical interaction contribute to lower physiological arousal in patients [47,48]. The positive effects of affective communication have been largely acknowledged, and associated with satisfaction [49,50], lowered anxiety and distress [51-54] as well as decreased physiological arousal measured with skin conductance level [55]. Our study adds the attenuating effect of physicians' affective communication on parents' adrenocortical activity to these existing findings. Furthermore, attesting these beneficial effects for parents extends our knowledge in the area of physician-patient interactions to the pediatric context, as this field of research has received less attention in the past and focused mainly on outcomes such as parent compliance or parent satisfaction [56,57].

It is worth accentuating that pediatricians' nonverbal behavior was associated with a decrease in parents' cortisol response. To the best of our knowledge, pediatricians' positive

nonverbal behaviors have been linked with several patient outcomes, including satisfaction, trust and adherence [31], but not with neuroendocrine strain measures. Our finding emphasizes the significant role of nonverbal behavior in social interactions, particularly in the health care context. Patients seem to pay strong attention to nonverbal cues, as these may complement physicians' verbal communication [2,58]. One reason for this may be that nonverbal cues are much more difficult to dissipate, and therefore reflect more accurately physicians' attitudes and behaviors [31].

Overall, these results corroborate previous empirical findings that emphasize the beneficial effects of social support, specifically emotional support, on strain and physiological arousal [13]. Emotional support, operationalized in our study through pediatricians' affective communication behaviors, represents therefore an effective way to reduce distress and arousal in parents attending medical consultations. This is a non-negligible aspect in the pediatric context, as social support is one of parents' greatest unmet needs during a child's illness [59], but care and support seem to be mainly centered around the sick child and directed less towards family members [60]. Furthermore, when pediatricians talk to children, this mainly consists in affective behaviors like social and joking utterances, whereas communication directed toward parents is dominantly instrumental [57]. Thus, our findings suggest that pediatricians should enlarge their attention to include affective communication behaviors towards parents, as these may foster health-related outcomes in children and parents alike.

The results of our study need to be considered in the light of a few limitations. First, the non-experimental nature of our study does not allow drawing causal inferences. Second, our sample consisted of parents, while we consider this as a strength since it enables us to separate reactions to the encounter from illness characteristics, our findings cannot be generalized to the patient population. Furthermore, the majority of our sample consisted of mothers (82.4%), which limits generalizability of our findings to fathers. Moreover, we controlled for a number of intervening variables, including participants' smoking habits. The

preferable solution would be to assess daily nicotine, coffee, and alcohol consumption as well [41]. For further studies, we suggest including parents' assessments of characteristics of the medical interview perceived as stressful. This information would help pediatricians tailor their communication more effectively towards parents' needs and concerns. Also, we used a global measure for nonverbal behaviors. Future research should focus on specific nonverbal behaviors in order to determine which communication elements prove to be the most efficient.

4.2. Conclusion

In summary, we found that parents perceived the medical encounter in the pediatric context as stressful, as indicated by their humoral stress responses. The affective communication of the pediatrician can be a useful element of the encounter that helps to reduce this stress response.

4.3. Practice implications

These findings have important implications for pediatricians and health care practitioners who are involved in pediatric care, but may be applicable to other medical fields as well. Pediatricians' affective communication behavior during the medical visit can lower parents' distress and physiological arousal, representing a source of social and emotional support. As doctor-patient communication is increasingly being considered a crucial element of good practice in medical care [61], our findings are also relevant for curricula of medical training.

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Table 1*Table 1. Frequencies, means, standard deviations, ranges, and intercorrelations of study variables*

	Frequencies	Mean (SD)	Range	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Parent Sex	0 = father 1 = mother	12 56			-.39**	-.43**	.29*	-.14	.09	-.04	.02	-.16	-.04	.02	-.08	-.18	-.09	-.23	.08
2. Parent Age		33.47 (5.29)	20-47			.17	-.10	.12	-.02	.10	.01	-.006	-.07	-.04	.04	.00	.15	.20	-.00
3. Smoking	0 = no 1 = yes	54 14					-.17	.12	-.11	-.01	.08	-.01	-.06	-.07	.02	-.09	-.03	.13	-.04
4. Contraceptiva	0 = no 1 = yes	46 22						-.12	.14	-.03	.17	-.10	.15	.17	.04	.06	.09	-.03	.05
5. Physical activity	0 = no 1 = yes	66 2							.17	.09	-.06	.23	.05	-.09	-.13	.00	-.02	-.01	-.01
6. Food	0 = no 1 = yes	58 10								.22	.12	-.97	.22	.10	-.06	.09	.14	.04	-.03
7. Time of visit	0 = afternoon 1 = morning	14 54									-.04	-.48**	.30*	.07	-.11	.14	.53**	.35**	.36**
8. Medication	0 = no 1 = yes	61 7										-.05	.17	.00	.20	.01	.06	-.01	.06
9. Visit length		12.09 (7.51)	3.02-42.02										-.18	-.26	-.16	-.17	-.12	-.13	-.01
10. Cortisol t1		12.20 (4.64)	5.4-22.3											.49**	.43**	.72**	.21	.01	.01
11. Cortisol t2		13.28 (5.07)	4.3-24												.49**	.60**	-.03	.15	.16
12. Cortisol t3		14.40 (6.92)	5-29													.54**	-.23	-.26*	-.29*
13. Cortisol t4		11.77 (4.06)	4.9-20														.01	.00	-.07
14. Global Affect Scale		15.20 (2.51)	9-19															.25*	.47**
15. RIAS		5.72 (3.39)	0-17																.38**
16. Nonverbal Behavior		4.08 (0.92)	2-5																

**p < .01, *p < .05

Table 2

Table 2. Hierarchical linear models predicting change in cortisol secretion from physicians' Global Affect Ratings, RIAS codes and Nonverbal Behavior

	<i>Global Affect</i>	<i>RIAS</i>	<i>Nonverbal</i>
	<i>Scale</i>		<i>Behavior</i>
	<i>Effect (se)</i>	<i>Effect (se)</i>	<i>Effect (se)</i>
Intercept	-.01 (.02)	-.005 (.02)	-.008 (.02)
Gender	-.01 (.06)	-.03 (.06)	-.003 (.06)
Age	.005* (.002)	.004 (.002)	.004 (.002)
Smoking	-.01 (.04)	-.006 (.04)	-.01 (.04)
Hormonal Contraceptives	-.01 (.02)	-.02 (.02)	-.02 (.02)
Physical activity	-.14 (.08)	-.14 (.08)	-.12 (.10)
Food	-.04 (.04)	-.03 (.04)	-.04 (.05)
Time of the day	-.06 (.05)	-.09* (.05)	-.08* (.04)
Medication	.07 (.08)	.06 (.08)	.07 (.08)
Visit length	-.004* (.002)	-.005*** (.002)	-.004* (.002)
Global Affect Scale	-.02*** (.005)		
RIAS		-.01* (.006)	
Nonverbal Behavior			-.03** (.01)
Deviance reduction	-2.09***	-2.24***	-2.61***

*** p < .01, ** p < .05, * p < .10

Figure 1

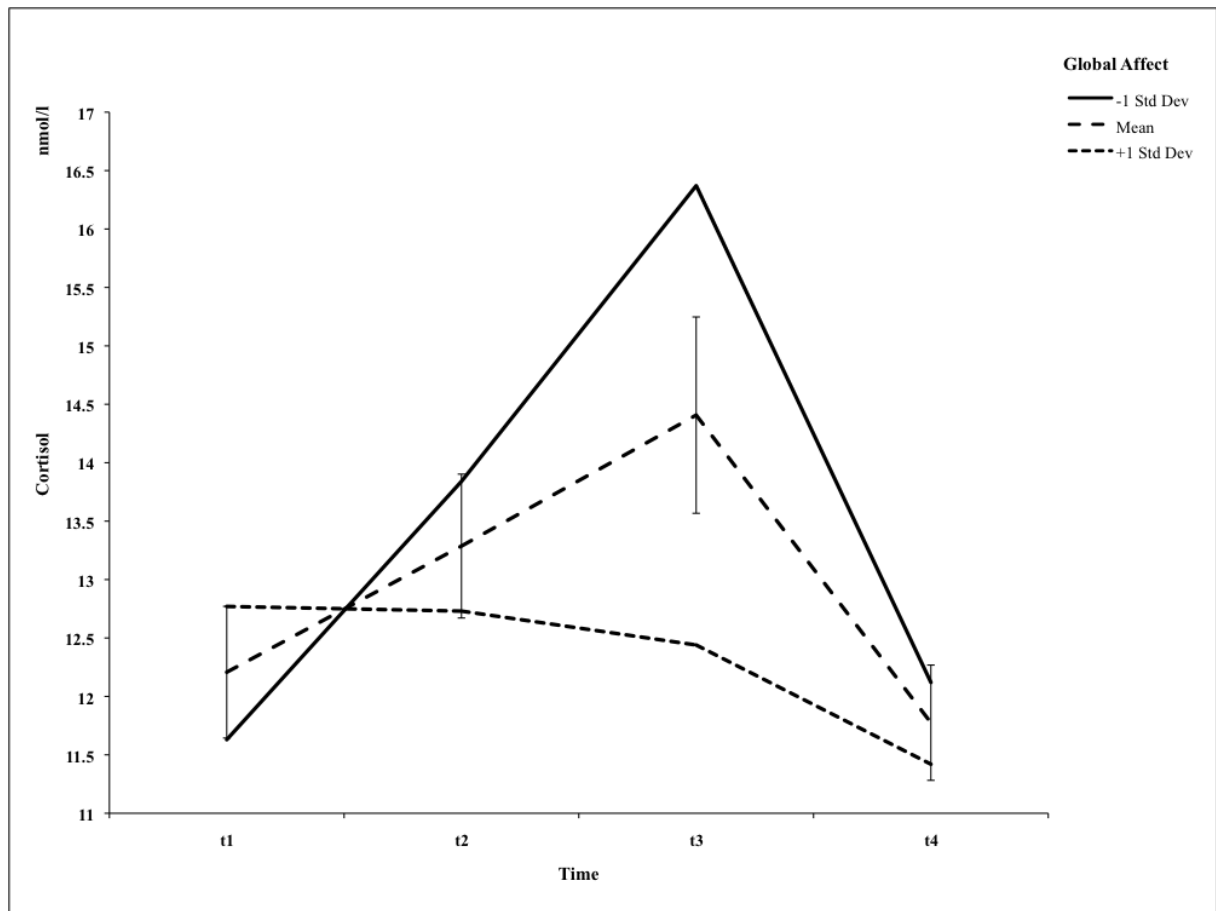


Figure 1. Mean raw cortisol values and error bars (SE) in nmol/l for the whole sample of parents (N=68) as well as impact of pediatrician's global affective behavior on parent cortisol at ± 1 SD from the mean

2.2. Paper 2

Pediatric Consultations: Negative-Word Use and Parent Satisfaction

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Abstract

Objective

This study investigates the impact of pediatricians' negative-word use on parents' affective quality and satisfaction judgments during the medical encounter.

Methods

In total, 68 medical consultations were videotaped and pediatricians' communication transcribed for analysis. We employed the Linguistic Inquiry and Word Count application in order to measure the amount of negative words used by the pediatrician. Parents rated their momentary mood as well as their satisfaction at the end of the encounter.

Results

Pediatricians' negative-word use was negatively linked to parents' affect quality, but not with the satisfaction ratings after the medical visit. Although there was no direct effect, our results revealed an indirect effect of pediatricians' negative-word use on parents' satisfaction via parents' mood.

Conclusions

The results point to the negative impact that words employed during the medical encounter can have on individuals in need of care. Consequently, this is relevant for clinical training and practice.

Keywords: affect; negative-word use; physician-parent communication; satisfaction.

Introduction

Talk is at the core of the medical visit and, hence, physicians' communication skills are a crucial element in the encounter with patients. Researchers and practitioners alike advocate the importance and benefits of a patient-centered approach in the context of medical communication (Mead & Bower, 2000). Focusing on the patient as person and putting the priority on the interpersonal facet of care has proven to have positive effects on proximal and distal patient outcomes (Roter & Hall, 2006).

Physicians' communication takes a particular role in pediatric consultations, because besides performing physical examinations of the child, parents remain pediatricians' primary conversational partners and talk is therefore the only medical practice occurring between these two parties. In this context, pediatricians' effective communication behaviors have been associated with parental satisfaction, adherence to treatment recommendations, and discussions of psychosocial concerns (Hatcher & Richtsmeier, 1990; Jessee & Nagy, 2001; Magaret, Clark, Warden, Magnusson, & Hedges, 2002; Swedlund, Schumacher, Young, & Cox, 2012; Hart, Kelleher, Drotar, & Scholle, 2007; Nobile & Drotar, 2003). The medical encounter is sufficiently stressful to elicit a cortisol response in parents, and pediatricians' affective communication behavior was recently shown to attenuate parents' stress response (Gemmiti et al., 2016). Features of such patient-centered communication are well defined and include, amongst others, behaviors like warmth, friendliness, empathy and encouragement (Beck, Daughtridge, & Sloane, 2002; Bensing & Dronkers, 1992; Roter & Hall, 2006; Verheul, Sanders, & Bensing, 2010). This perspective is rather global and does not give insight into specific communication elements that physicians can implement in their communications (Bensing, van Dulmen, & Tates, 2003; Burgers, Beukeboom, & Sparks, 2012; Verheul, Mistiaen et al., 2010). More specific issues relate to the modalities through which medical talk is conveyed (Heritage & Maynard, 2006).

Particularly, pediatricians' language use and how this is linked to parental outcomes is a promising target that has not received attention, so far. The few studies available point to positive and negative effects physicians' word use may exert on patients' perceptions and mood during medical interactions (Cyna & Lang, 2011; Häuser, Hansen, & Enck, 2012; Heritage, Robinson, Elliott, Beckett, & Wilkes, 2007; Lang et al., 2000; Lang et al., 2005). Specifically, physicians' negative-word use seems to have unfavorable effects on patients' proximal and distal outcomes. For example, physicians' communication in pediatric weight management often includes words like "obesity" and "overweight", and parents seem to prefer neutral language (Farnesi, Ball, & Newton, 2012). In the adult patient population, physicians' employment of words like "sting" or "burn" during medical procedures is related to patients' negative affect and experience of pain (Lang et al., 2000). In another study, Heritage et al. (2007) varied the word "anything" (negative polarity) or "something" (positive polarity) in the question "Is there anything/something else you want to address in the visit today?". Using the word "something" increased patients' disclosure of unmet concerns to nearly 80% compared to the word "anything". Studies focusing on the delivery of bad news indicate that physicians prefer to use indirect language in order to soften the impact of their message (Del Vento, Bavelas, Healing, MacLean, & Kirk, 2009; Rodriguez, Gambino, Butow, Hagerty, & Arnold, 2007). One strategy to mitigate the effects of information the patient receives and to appear polite is to use negations (e.g. "your lung function is not bad") instead of affirmations (e.g. "your lung function is good"; Beukeboom, 2014; Burgers et al., 2012). Such negations are negatively perceived by patients, and associated with decreased adherence intentions and negative evaluations of the physician (Burgers et al., 2012). These examples give an idea of the broad range of negative words that may be used by the physician during the medical visit. Furthermore, these may not only occur in negative messages, but as well in positively framed sentences meant to be compassionate and helpful (Lang et al., 2005).

From the parents' perspective, talking with the pediatrician often involves stress and anxiety (Jessee et al., 2001), which may alter the focus of information processing and influence the perception of the conveyed message. Specifically, stressful situations are known to deplete one's attentional resources (Chajut & Algom, 2003) and are associated with an attention bias toward threatening stimuli occurring at an early stage of preconscious information processing (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van IJzendoorn, 2007). Translated into the pediatric context, parents experiencing stress and anxiety during the medical encounter would focus their attention on negative aspects of physicians' talk (Cyna & Lang, 2011; Eysenck, Derakshan, Santos, & Calvo, 2007; Hansen & Bejenke, 2010; Häuser et al., 2012; Mathews, 1990; Ridley & Clifford, 2006). In addition to the attentional narrowing, selective attention also plays an important role in the regulation of mood, with attentional focus on negative stimuli favoring negative mood responses (Ellenbogen, 2005). This occurs because the use of negative words may prime neural networks in individuals (Murphy & Zajonc, 1993), resulting in more negative cognitions that adversely influence affect (Barsky, Saintfort, Rogers, & Borus, 2002; Kirsch, 2004). Thus, words with negative emotional valence may generate negative affective reactions in parents, also referred to as the "nocebo response" in the health-care setting (Hahn, 1997; Häuser et al., 2012).

Affective states have been differentiated in two dimensions that respond differently to adverse stimuli (Clark & Watson, 1988). On one side, negative affect is deemed emergency-driven and reactive in nature, and mainly associated with daily hassles and stressors. In contrast, positive affect is distributed rather evenly during the day with change occurring more slowly and typically covarying with the quality of ordinary social interactions (Watson, 2000). In our context, the overall amount of negative words used by the pediatrician should not have the characteristics of strong adverse stimuli eliciting specific negative emotions in

parents, but rather reflect general interaction quality and therefore relate to parents' unspecific positive mood state (Watson, 2000).

Based on this reasoning, we expect pediatricians' negative-word use to negatively influence parents' positive mood during the medical consultation and posit the following:

Hypothesis 1: Pediatricians' negative-word use is negatively associated with parents' momentary positive affect.

Pediatricians' negative-word use is not only likely to impact parents' affective states, but may affect parents' level of satisfaction with the encounter, as well. Parental satisfaction with the medical visit is a key outcome in the healthcare context (Levetown, 2008; Waisman et al., 2003), and is associated with compliance and adherence to medical treatment (Ammentorp, Mainz, & Sabroe, 2005; Hatcher & Richtsmeier, 1990; Lewis, Scott, Pantell, & Wolf, 1986). Many scholars agree that the concept of patient satisfaction is a subjective perception of the care received, consisting of a "cognitive evaluation of the service that is emotionally affected" (Gill & White, 2009, p. 10). Thus, when patients perform an evaluation of the medical encounter, their momentary mood state contributes to their judgment, and this may constitute an explanatory aspect linking pediatricians' negative-word use to parental satisfaction (our line of thought concerning the influence of affective states on satisfaction relies on the theoretical framework of Affective Events Theory (AET); for more see Weiss and Cropanzano, 1996). Consequently, and in line with current views about the development of evaluative judgments (Bower, 1991; Lerner & Keltner, 2000; Scott & Judge, 2006), differences in parents' satisfaction ratings regarding the medical visit may be explained to some degree by differences in affective states (Gill & White, 2009; Scott & Judge, 2006; Sixma, Spreeuwenberg, & van der Pasch, 1998) because an unpleasant experience may stimulate retrieval and activation of unpleasant information, and vice versa (Bower, 1991; Siemer & Reisenzein, 1998). In our context, parents experiencing a decrease in their positive affect may give more negative evaluations about the medical interaction, in part because the

activation of the respective neural networks makes negative information readily more accessible (Crow et al., 2002; Gill & White, 2009; Urden, 2002).

Based on our argumentation, a part of the variation in satisfaction ratings may be related to pediatricians' negative-word use. Because we suppose that satisfaction ratings are partly influenced by affective states, the effect of pediatricians' negative-word use on parents' satisfaction may be transmitted through parents' momentary affect:

Hypothesis 2: There is a direct negative relation between pediatricians' negative-word use and parents' satisfaction ratings. Furthermore, pediatricians' negative-word use is indirectly related to parents' satisfaction ratings via its influence on parents' positive affect.

Method

Setting and participants

This present study is part of a larger project addressing the relationship between specific pediatrician communication behaviors and proximal parental outcomes (for more details see Gemmiti et al., 2016). Between October 2010 and November 2013, the first and third author recruited participants at pediatric out-patient and in-patient consultations in two different Swiss clinics. The number of participants required was determined by a power analysis. An expected medium effect size was derived from the literature on the variables of interest (Burgers et al., 2012; Petersen et al., 2014; Westermann, Spies, Stahl, & Hesse, 1996). To detect such an effect, with α set to 0.05 (two-tailed) and a power range between 0.80 and 0.90, the optimal sample size varies between 55 and 73. In our study, 68 parents agreed to participate in total. The majority of the sample consisted of mothers (82.4 %), and the average age was 33.4 years ($SD = 5.29$). Concerning education, nearly the same number of parents had compulsory education (≤ 9 years of formal education; 29.4%), tertiary education (≥ 15 years of formal education; 29.4 %), and secondary education ($= 12$ years of formal education; 25 %; missing data, 16.2%), respectively. The age of children involved in

the study ranged between 2 months and 15.6 years, and the reasons for treatment were diverse (e.g. asthma, fever, nutritional allergies, gastroenteritis).

In total, 19 pediatricians agreed to participate in the study and were mostly female (73.3 %). The average age was 31.95 years ($SD = 6.74$), and pediatricians differed as to their position (resident, 63,2%; senior physician, 19,1%; chief physician, 17,6%) and work experience ($M = 7.15$ years, experience range: 0.5-28 years). On average, each physician saw 4 patients ($SD = 3.27$, range: 1-10).

The parents were informed about the purpose and procedure of the study, as well as the videotaping of the consultation. After receiving informed consent from the parents, we asked them to complete a questionnaire containing socio-demographic information. In order to analyze the content of physicians' communication, the entire medical consultation was videotaped. The video camera was generally set up in a corner of the room facing the pediatrician, and the researcher stayed in the room during the whole consultation. At the end of the consultation, parents were asked to complete a questionnaire assessing their current mood and satisfaction with the medical visit.

Ethical considerations

The Human Research Ethics Committees of the Canton of Vaud and Canton of Fribourg (Switzerland) have given approval for this study.

Instruments and measures

Negative-word use. We employed the Linguistic Inquiry and Word Count (LIWC; Pennebaker, Chung, Ireland, Gonzales, & Booth, 2007) application to measure the amount of negatively connoted words used by the pediatricians during the medical encounter. The LIWC allows counting the words that are present in spoken or written text, and subsequently assigns the text to psychological dimensions. The LIWC has initially been developed to analyze the effects of individuals' expressive writing on their mental and physical health (Pennebaker & Francis, 1996). It has rapidly found application in a variety of contexts such as personality

research (Hirsh & Peterson, 2009), relationship research (Ireland et al., 2011) or social network analysis (Pfeil, Arjan, & Zaphiris, 2009), and is increasingly used to analyze communication patterns in the healthcare context (Bekker, Hewison, & Thornton, 2003; Sakai & Carpenter, 2011; Shields et al., 2013; Shields et al., 2010). In order to capture the pediatrician's negative-word use, we analyzed the percentage of words that fell into the categories "negative emotion" (e.g. hurt, worried, sad), "inhibition" (e.g. block, constrain, stop) and "negations" (e.g. no, not, never) from the LIWC dictionary. Because the consultations were either held in French or German, the corresponding validated dictionaries were used for the analyses (Piolat, Booth, Chung, Davids, & Pennebaker, 2011; Wolf et al., 2008).

Affect. Parents' affect was measured after the medical visit with two items from the Multidimensional Mood Questionnaire (Steyer et al., 1994), asking for parents' positive affect (Right now I feel...content, Right now I feel...good). Each item was rated using a five-point rating scale (ranging from "not at all" to "very much"). The internal consistency of the positive affect was .86.

Satisfaction. We used four items proposed by Roter and Hall (2006) in order to measure parents' satisfaction with the medical visit. The first two items asked about the humanness of the pediatrician (How satisfied are you with the respect accorded you by your doctor? How satisfied are you with how carefully your doctor listened to what you had to say?). The third item referred to the explanations (How satisfied are you with the explanations given to you by the physician?), and the fourth item to the answers given by the pediatrician (How satisfied are you with the answers you got to your questions?). A 6-point rating scale (ranging from "very unsatisfied" to "very satisfied") was used in order to rate parental satisfaction. The internal reliability for this scale reached .89 (Cronbach's alpha).

Covariates. We assessed the chronicity of the child's illness because this may explain differences in parents' affective wellbeing as well. For severe or chronic cases of illness, the

literature reports higher impairments in parents' wellbeing, in terms of psychological distress and affective states, compared to parents of children with less severe or no illness (Boman, Viksten, Kogner, & Samuelsson, 2004; Last & Grootenhuis, 1998; Miller, Cohen, & Ritchey, 2002). Parents gave information about the medical diagnosis of the child's illness prior to the medical interview. The third and fifth author classified the diagnosis according to their curability (0 = curable, 1 = not curable, 2 = unclear if curable). Then, in order to get a dichotomized variable, we merged category 1 and 2 together (0 = curable, 1 = not/unclear if curable). Parental age is another variable that may affect parents' affective states. Younger parents are generally less experienced with childcare and this may accentuate their perception of illness threat, and consequently increase their distress and negative affect (Hansen, 1994). Furthermore, they may also have higher expectations towards medical care that are unlikely to be met, resulting in lower satisfaction compared to older parents (Jaipaul & Rosenthal, 2003).

Analytic strategy

Because of the nonindependence in our data (each pediatrician saw a different selection of parents, and consequently parents are "nested" within pediatricians, i.e., a one-with-many design), we tested whether significant variance in the dependent variables was explained at the pediatrician level. We calculated the intra class correlation coefficient (ICC) of the null model using HLM 7.01 (Raudenbush et al., 2011). Estimation of the null model revealed an ICC(1) of .00 for both parental affect and satisfaction, which indicates that an individual level analysis is sufficient. We therefore applied a simple regression model including physicians' negative-word use as predictor, parents' satisfaction and parents' positive mood as direct and indirect outcomes. The chronicity of the child's illness as well as parents' age were introduced as covariates. We used Hayes' macro for *SPSS* called *PROCESS* (Hayes, 2013), which allows estimations for direct and indirect effects, and has the advantage of applying bootstrapping methodology to generate bias-corrected confidence intervals for indirect effects.

Results

Descriptives and correlations

The length of the medical visit was shorter in the inpatient consultation ($M = 10.54$, $SD = 5.07$, range: 3.20-23.52) as compared to the outpatient consultation ($M = 15.19$, $SD = 4.94$, range: 4-21.04; $t = -3.27$, $p < .01$). On average, pediatricians used 5.28 % negative words ($SD = 1.61$, range: 1.73-9.33) in their spoken communication from the categories “negative emotions”, “negations” and “inhibition”. Parents’ positive mood after the medical visit averaged 7.04 ($SD = 1.95$, range: 2-10), and their mean satisfaction rating was 5.45 ($SD = 0.74$, range: 1.5-6). Table 1 presents means, standard deviations and correlations among study variables. As can be seen in Table 1, controlling for illness chronicity of the child and parent’s age was not significantly associated with any of our dependent measures, and are therefore not particularly denoted or discussed.

Hypotheses testing

In our tested model, no evidence was found for the influence of pediatricians’ negative-word use on parents’ satisfaction ($b = .03$, $p = .58$, 95% CI: [-0.0731, 0.1283]). However, parents reported the lower positive affect after the medical visit the more negative words were employed by the pediatricians during the interaction ($b = -.30$, $p < .05$, 95% CI: [-0.5996, -0.0091]). Furthermore, parents’ positive affect was linked to their satisfaction ratings with higher affect scores associated with higher satisfaction concerning the medical visit ($b = .19$, $p < .001$, 95% CI: [0.1111, 0.2761]). Ultimately, pediatricians’ negative-word use indirectly affected parents’ satisfaction through its effect on parents’ positive affect ($b = -.06$, 95% CI: [-0.1777, -0.0112]).

Discussion

Our study took a close look at the linguistic features of pediatricians’ language and their influence on proximal parent outcomes in a real medical setting. Specifically, we analyzed pediatricians’ negative-word use during pediatric consultations and its relationship

with parents' affect and satisfaction ratings after the medical encounter. Our findings support the assumption that pediatricians' negative-word use is negatively related to parents' momentary affect after the consultation, and these changes link pediatricians' negative-word use to parents' satisfaction, ultimately.

Our first hypothesis posited an adverse relationship between pediatricians' negative-word use and parents' satisfaction with the medical visit, but our results only revealed a small effect that was not statistically significant. There are several explanations for this finding. First of all, words with high negative emotional valence are susceptible to capture parents' attention (Farnesi et al., 2012), but may not occur frequently during an ordinary medical visits compared to visits involving medical procedures. Therefore, we did not limit our focus on such words, but rather tried to include the whole range of negative words employed during the conversation, comprising negative words that may occur in a positively framed communication. These negative linguistic features are much more subtle and less readily detected and may operate below the threshold of conscious awareness, therefore relating more strongly to parents' affective experiences rather than to their satisfaction judgments. Thus, the subtlety of the phenomenon may account for this non-significant effect.

With regard to the quality of parents' affect, we did find a dampening association between pediatricians' negative-word use and parents' positive affect. Besides confirming existing research in this domain (e.g., Cyna & Lang, 2011; Häuser et al., 2012; Lang et al., 2005), this finding broadens our understanding of the impact of negative words on patient outcomes. Until now, specific negative word choices were known to trigger affective reactions in patients undergoing medical procedures (Lang et al., 2005), but our study underlines the significance of an overall negative-word use for parents' affective experience during an ordinary medical visit. Albeit their important role, parents differ from patients as their own physical integrity is not threatened, and to some extent, their involvement is limited to verbal interactions with the pediatrician at predefined moments. Nevertheless, we found

parents' affect to be associated with pediatricians' negative-word use in a similar way as effects reported in previous studies, and this could indicate parents' high emotional involvement and resulting vulnerability when they have to talk to the pediatrician. Besides the interference of the child's illness with family- and work-related obligations, parents have to carry the related emotional burden (Hopia, Tomlinson, Paavilainen, & Astedt-Kurki, 2005; Jessee et al., 2001). Furthermore, the medical consultation itself adds to parents' prior level of strain, and such accumulation of emotional demands may increase their susceptibility towards negative elements of the pediatricians' communication behavior. Hence, this may explain the negative relationship of pediatricians' overall negative-word use and parents' affective experience.

We further investigated the relationship between parents' affective states and their satisfaction with the medical visit. In our sample, parents reporting higher positive affect also reported to be more satisfied with the medical interaction. This contributes to our knowledge about the determinants that account for variations in satisfaction ratings in healthcare. A considerable part of variance is on the patient level (Gill & White, 2009; Hekkert, Cihangir, Kleefstra, van den Berg, & Kool, 2009), highlighting the importance of patients' expectations and experiences linked to the medical interaction. In our study, parents' positive affect accounted for variations in subsequent satisfaction ratings after the medical encounter. More interestingly, the level of affect related to pediatricians' negative-word use during the medical interaction. Thus, we provide evidence that pediatricians' communication behavior does explain variance in affect above and beyond preexisting individual differences. Furthermore, these communication-related differences in affect were related to differences in satisfaction ratings in line with our last hypothesis that posited an indirect effect of pediatricians' negative-word use on parents' satisfaction. In other words, parent's positive affect was negatively related to the negative words the pediatrician employed during the consultations, and this in turn explained variation in their satisfaction with the medical visit.

In light of our findings, physicians' word use plays an important role during the medical interaction. In our sample, the use of negative words was negatively associated with proximal parental outcomes during the medical visit. Parents caring for a sick child may experience higher stress levels and show increased fluctuations in positive and negative affective states (Röcke, Li, & Smith, 2009). Actively regulating such emotions requires substantial effort from the parents that may exhaust their self-regulatory capacities, and increase their tendency towards maladaptive behaviors (Ryan & Deci, 2008; Tice, Baumeister, Shmueli, & Muraven, 2007). Positive affective states are known to counteract such depleting effects. In fact, they exert stress-buffering functions by undoing the harmful effects caused by negative emotions, preventing further distress and helping to generate personal resources in the longer term (Garland et al., 2010). Consequently, it is important that pediatricians are aware of the fact that how they communicate during the medical interaction may harm parents unintentionally. Thus, they may want to pay extra attention to their communication behavior and choose words that are rather neutral or of positive valence, and thereby contribute to positive affect that can help parents under stress recover faster (Fredrickson, Mancuso, Branigan, & Tugade, 2000). In addition, our findings are also relevant for teaching physicians' communication skills, and thus, this issue of word choice, especially negative-word use, could be touched upon in medical training. The following example will help illustrate the implications of our findings: A parent goes with her 7-year old daughter to the pediatrician for a routine well-child visit. During the exam, the pediatrician finds out that the child has a BMI at one of the last percentiles. She tells the parent the following: "Oh, your daughter is obese. This is really bad, as this condition can be dangerous for her in the long run. Let's see together what we can do to reduce and eliminate her overweight." Instead, and in order to minimize negative language, the pediatrician could say: "Oh, your daughter is at the upper end of the BMI scale, which means that she has gained a

lot of weight. This is an issue that we need to address, in order for her to maintain good health in the future. Lets' see together what we can do to bring her back to the normal range.”

In this study, we observed pediatricians' negative-word use and parents' affect and satisfaction occurring in real pediatric consultations, thus obtaining a snapshot of the interactional dynamic occurring between physicians and parents. This is an extension of the existing literature, which mainly focused on adult patients undergoing medical procedures (Häuser et al., 2012). Furthermore, and in order to complement research on general communication styles, we used a micro-analytical approach providing insight into physicians' negative-word use during the medical visit. Several shortcomings need to be acknowledged as well. First, our correlational design does not allow causal inferences because we did not systematically manipulate physicians' negative-word use. Caution needs to be addressed as well with regards to the interpretation of our data, since we did not assess change of parents' mood over the course of the medical consultation. While we assume that pediatricians' negative word use did change parental mood throughout the consultation, reverse causation is also possible in that parents' mood state at the beginning of the consultation may have led to increases of pediatricians' negative word use or an unmeasured third variable may have influenced both, word use and parents' affect. Secondly, we focused on individual negative words without embedding them into their context. Thus, it is not possible to determine whether our effects vary depending on the specific framing of the sentence. Negative words embedded in negatively framed communication may have a stronger impact compared to negative words in positively framed communication (Burgers et al., 2012). Thirdly, the role of the child was not taken in consideration in our study. The child has an important role in the communication process as well as on the content of the interaction (Tates & Meeuwesen, 2001), and because of this shortcoming our study fails to reflect the full interactional dynamic that is distinct to the pediatric context. Ultimately, we acknowledge that work experience may play a role in the relationship between pediatricians' negative word use and parental

satisfaction. We did not include it as a covariate, however, since it was very unevenly distributed and we wanted to avoid biased parameter estimates that would render interpretation difficult.

For future research, controlled experiments, preferably in the field, in which the valence of pediatricians' vocabulary is systematically manipulated, would complement our method and allow testing causal relationships between physicians' negative-word use and diverse outcomes. Furthermore, we recommend exploration of physicians' negative-word use in specific pediatric settings, for example in pediatric cancer care (Vrijmoet-Wiersma et al., 2008) or situations of bad-news delivery (Fallowfield & Jenkins, 2003; Harrison & Walling, 2010), as such contexts may differentially affect parents' perceptions and affective experiences. Physician and patient characteristics (e.g. gender, education, personality traits) may exert a moderating role as well, and such effects should be considered in future studies. Ultimately, more research is needed on the conditions on which negative-word use depends and in order to better disentangle the role of linguistic variables in the context of health communication. This would help to elaborate empirically founded guidelines that address specific issues concerning the use of negative words during medical consultations.

In sum, this study provides evidence for the importance of physicians' communication skills; how talk is formulated during the medical encounter may have positive or negative influences on individuals in need of care. Especially, employing words with negative emotional content may adversely relate to patients' perceptions and affect during the medical encounter. Thus, it is important for physicians to be aware of those aspects that may foster positive patient outcomes, and this includes their word choice as well.

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Table 1

Means, SD and Intercorrelations for the Variables of Interest

	Mean (SD)	1	2	3	4	5	6	7
1. Parent Age	33.47 (5.29)	1						
Mother	32.52 (4.74)							
Father	37.92 (5.66)							
2. Parent Sex			1					
0 = father	17.6%							
1 = mother	82.4%							
3. Parent Education				1				
0 = primary education	29.4%							
1 = secondary education	25%							
2 = tertiary education	29.4%							
4. Illness chronicity					1			
0 = not/unclear if curable	54, 4%							
1 = curable	45,6%							
5. Parent's positive affect	7.04 (1.95)					1		
Mother	6.87 (2.04)							
Father	7.83 (1.19)							
6. Parent's satisfaction	5.50 (0.72)						1	
Mother	5.48 (0.75)							
Father	5.62 (0.54)							
7. Pediatrician's negative-word use	5.27% (1.28)							1
Female Pediatricians	5.28% (1.47)							
Male Pediatricians	4.43% (1.61)							

** $p < .01$, * $p < .05$

2.3. Paper 3

Physicians' speech complexity and interrupting behavior in pediatric consultations

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Abstract

Physicians' communication behavior is an essential aspect of the medical visit in the pediatric context, affecting a variety of outcomes both in child and parents. So far, little attention has been given to physicians' speech complexity and interrupting behavior, and this study analyzes how these behaviors relate to parents' recall of medical information as well as satisfaction with the medical visit. Participants in our study were 19 physicians and 68 parents recruited at pediatric outpatient and inpatient consultations. The medical interaction was videotaped and analyzed in order to assess physicians' speech complexity and interrupting behavior. At the end of the encounter, parents filled out two questionnaires in order to assess their satisfaction with the medical visit and their recall of medical information. Our results evidence that recall of medical information is negatively associated with physicians' interrupting behavior for parents reporting low positive mood, but not with physicians' speech complexity. We also found lower educated parents to report less satisfaction the more complex language physicians employed. Furthermore, parents' satisfaction was negatively associated with physicians' interrupting behavior, especially when displayed by male physicians.

Keywords: Physician-patient communication; Speech complexity; Interruptions; Recall; Satisfaction

Introduction

In a pediatric context, parents' comprehension of medical information and satisfaction with the medical visit are key outcomes (Levetown, 2008; Waisman et al., 2003) that are associated with compliance and adherence to medical treatment (Ammentorp, Mainz, & Sabroe, 2005; Hatcher & Richtsmeier, 1990; Lewis, Scott, Pantell, & Wolf, 1986). In fact, in addition to coping with the multiple demands related to the child's illness (Fernández-Castillo, Vílchez-Lara, & López-Naranjo, 2012; Streisand, Braniecki, Tercyak, & Kazak, 2001), parents have to take medical decisions and comply with medical advice and the treatment plan received during the medical visit. But in spite of its importance, health care communication in the pediatric context is not always optimal (Hart, Drotar, Gori, & Lewin, 2006; Levetown, 2008), and parental understanding and retention of medical information often rather low (Bayldon, Glusman, Fortuna, Ariza, & Binns, 2013; Grover, Berkowitz, & Lewis, 1994). Furthermore, parental low satisfaction with the health care experience is often related to poor communication between health care professionals and parents (Fisher & Broome, 2011).

Reasons for such poor results may lie within communication behaviors displayed by the physician during the interaction with the parent. For example, physicians' speech complexity is thought to be related to patient's understanding and recall of information, but has received little attention in empirical research (Bradshaw, Ley, & Kincey, 1975; Ley, 1979; Watson & McKinstry, 2009). So far, studies investigating language complexity have predominantly focused on medical-jargon use or readability of written health information (Freed et al., 2013; Howard, Jacobson, & Kripalani, 2013; Jackson, 1992; van Weert et al., 2010; Wilson & Wolf, 2009), but have not included facets that reflect syntactic and semantic characteristics. Given that such language features account for the complexity of spoken language and influence comprehension (Wingfield, 2000; Wingfield, Peelle, & Grossman, 2003), we investigate in our study how these affect parents' recall of medical information

during the medical interaction. Furthermore, physicians' speech complexity may as well affect parents' satisfaction, as they expect the information sharing during the medical interaction to occur in a clear and comprehensible way (Ammentorp et al., 2005; Hallström, Runesson, & Elander, 2002). Thus, physicians employing comprehensible speech should meet this expectation and be perceived as considerate by parents.

A behavior that may also affect parents is physicians' interrupting behavior. Research findings so far do not provide a conclusive picture about its characteristics and effects on patient outcomes (Hall, Roter, & Rand, 1981; Li, Krysko, Desroches, & Deagle, 2004; Menz & Al-Roubaie, 2008; Rhoades, McFarland, Finch, & Johnson, 2001; Rowland-Morin & Carroll, 1990), but conceptual discussions point to their positive and negative properties that potentially may affect parental recall and satisfaction (Černý, 2010; Li et al., 2004). In fact, interruptions are thought to have supportive functions, with the aim to bring clarifications and foster the information exchange between the physician and patient, but may also be employed to control the course of the medical visit and interfere with the conversational flow (Li et al., 2004).

The goal of our study is to fill this gap in the literature and analyze physicians' complexity of speech and interrupting behavior in relation to parents' recall of medical information, as well as satisfaction with the medical visit. To test for interactional effects, we included parents' mood, level of education, as well as physicians' gender, which are known to affect parental outcomes as well. Parents' momentary mood may impact cognitive performance and interfere with their ability to recall medical information (Brose, Lövdén, & Schmiedek, 2014; Watson & McKinstry, 2009). Parents' level of education is another characteristic that may impact the evaluation of the medical visit. In fact, physicians tend to show more directive behavior and give less information to low educated parents compared to their counterparts (Roter & Hall, 2006; Willems, De Maesschalck, Deveugele, Derese, & De Maeseneer, 2004). Furthermore, patients evaluate physicians' communication behavior

differently depending on physicians' gender, because they expect these to be consistent with their stereotype expectancies (Roter & Hall, 2006).

Physicians' speech complexity

Physicians' communication behavior and transmission of information is of special relevance in the pediatric context, because parents' primal need is to receive information about their child's health status, prognosis and treatment plan (Diaz-Caneja, Gledhill, Weaver, Nadel, & Garralda, 2005). Furthermore, parents need to make important decisions about their child's medical care and comply with medical advice, and consequently carry the responsibility to fully understand health-related information received during the medical visit. The challenge of this responsibility is amplified by the fact that parents' medical knowledge is low and they have to assimilate a lot of information in a short time.

Besides the adequate amount of information, physicians' clear and comprehensible language is critical for parents' understanding, recall and satisfaction (Brown & Wissow, 2008; Selic, Svab, Repolusk, & Gucek, 2010), but research findings evidence that these are rather poor (Bayldon et al., 2013; Grover et al., 1994). In practice, physicians tend to overestimate their communication abilities and often do not employ communication techniques that facilitate patient comprehension (Howard et al., 2013; Silberman, Tentler, Ramgopal, & Epstein, 2008), but rather use complex language containing medical jargon (Jackson, 1992; Ley, 1979). Physicians' syntactic and semantic complexity have been rarely studied in the past (Bradshaw et al., 1975; Ley, 1979), but are known to tax memory and processing capacities (Ley, 1979; Wingfield et al., 2003). Thus, we suggest that physicians' speech complexity, reflected by features of syntactic and semantic complexity, negatively relate to parental recall of medical information.

Furthermore, cognitive performance is known to vary within individuals and affected by stress and affective experiences (Brose et al., 2014; Brose, Schmiedek, Lövdén, & Lindenberger, 2012), and this phenomenon has also been evidenced in health care (Watson & McKinstry, 2009). In addition, stressful situations are related to decreases in positive mood states (van Eck, Nicolson, & Berkhof, 1998), which in turn are positively associated with cognitive performance. Positive emotions have been reported to broaden an individual's cognition, leading to careful and systematic cognitive processing, flexible thinking and improved recall (Fredrickson & Branigan, 2005; Isen, 2002; Martin & Kerns, 2011). We therefore suggest that parents reporting higher positive mood would be less affected by physicians' speech complexity compared to parents reporting lower mood.

Besides affecting parents' recall of medical information, we suggest that physicians' speech complexity may as well decrease parental satisfaction with the medical visit. As discussed earlier, parents have great informational needs concerning their child's health situation, and expect this information to be communicated in a clear and adequate manner (Hallström et al., 2002; Levetown, 2008). When physicians employ language that is easy to understand, parents' satisfaction may increase, as their needs are respected and they have a better understanding of the information received. This may be especially relevant for parents with low education levels, as it may be more difficult for them to follow and understand the medical conversation (Lukoschek, Fazzari, & Marantz, 2003), and they hesitate to voice their needs and expectations (Roter & Hall, 2006). We therefore include parents' educational background into our model and investigate how this characteristic modifies the relationship between physicians' speech complexity and parents' satisfaction ratings.

Hypothesis 1:

Physicians' speech complexity negatively affects parents' recall of medical information. This relationship is stronger the less positive mood parents report.

Hypothesis 2:

Physicians' speech complexity is negatively related to parental satisfaction with the medical visit. This negative association is the stronger for the lower parents' educational background.

Interruptions

Another communication behavior that may impact parental recall of medical information is physicians' interruptions. This behavior has predominantly been associated with physicians' status and dominance (Menz & Al-Roubaie, 2008), and used in order to control and give orientation to the medical consultation (Li et al., 2004). Research findings show that physicians interrupt already shortly after the beginning of the patients' account (Roter & Hall, 2006) and do so more often than patients (Beckman & Frankel, 1984; Marvel, Epstein, Flowers, & Beckman, 1999; West, 1984). Furthermore, they engage more in interruptions that inhibit the conversational flow initiated by the patient (Li et al., 2004). Typical for such negative interruptions are physicians' attempts to change the topic of the conversation or taking the floor of the patient and continuing to develop the conversation (Li et al., 2004). Such interruptions are uncontrollable and disrupting for the parent, and may require additional attention that draws upon their cognitive resources. Furthermore, physicians' negative interruptions may not contribute to parental understanding during the conversation, because the physician does not listen in detail to the parent and misses the opportunity to identify their perspective and prevent misunderstandings and incomprehension. Consequently, he cannot provide clarifications or missing information that is needed by the parent. Reversely, supportive interruptions may be employed to ask for clarification or understanding, providing assistance or communicating compliance and support (Li et al., 2004). Such positive interruptions are likely to be associated with adaptive communication behavior and supply of tailored information. As a result, parental recall of information received during the medical interview should increase. Positive interruptions may as well put

additional cognitive demands on parents, but to a lesser degree because they are synchronized with parents' attention and contribute to the exchange of clear information that may compensate this drawback. As discussed in the first section, parents' mood may as well affect their cognitive performance during the medical visit. We therefore include parents' positive mood as a moderating variable into our model, because we expect physicians' interruptions to stronger affect recall of parents reporting low positive mood compared to parents with higher positive mood.

Parental satisfaction should be positively related to supportive interruptions that contribute to uphold the conversation initiated by the parent and foster rapport-building (Li et al., 2004). Besides disrupting the conversational flow, negative interruptions may be considered by the parents as a violation of their interactional-fairness norms and as an expression of physicians' dominance (Li et al., 2004; Schmid Mast, Hall, Klöckner Cronauer, & Cousin, 2011) and consequently decrease their satisfaction.

The perception of physicians' interruptions has been shown to be a function of physicians' gender. Female physicians are expected behave in a way that is more sensitive and altruistic, whereas male physician's dominant behavior is consistent with patients' stereotype expectancies (Schmid Mast, Hall, & Roter, 2006; Roter & Hall, 2006). We therefore suggest the relationship between physicians' interruptions and parental satisfaction to be moderated by physicians' gender.

Hypothesis 3:

- a) Contrary to physicians' positive interruptions, negative interruptions should adversely affect parental recall of medical information.
- b) Furthermore, the differential effects of negative and positive interruptions should be stronger for parents reporting low positive mood.

c) Parents should report less satisfaction the more physicians use negative interruptions during the medical visit. Reversely, positive interruptions should be positively related with parents' satisfaction ratings.

d) Additionally, physicians' gender should moderate the relationship between physicians' positive and negative interruptions and parents' satisfaction.

Method

Setting and participants

68 parents recruited at pediatric outpatient and inpatient consultations in two different Swiss clinics participated in this study. The majority of the sample consisted of mothers (82.4 %), and the average age was 33.4 years ($SD = 5.29$). With regard to education, the participants attained predominantly secondary education (41.2 %), followed by similar levels of tertiary education (29.4 %) and compulsory education (29.4 %). The age of children involved in the study ranged between 2 months and 15.6 years, and the reasons for treatment were diverse (e.g. asthma, fever, nutritional allergies, gastroenteritis).

In total, 19 physicians agreed to participate in the study and were mostly female (73.3 %). The average age was 31.95 years ($SD = 6.74$), and physicians differed as to their position and work experience.

Procedure

The parents were informed about the purpose and procedure of the study, as well as the videotaping of the consultation. After receiving informed consent from the parents, we asked them to complete a questionnaire containing socio-demographic information. In order to analyze the content of the physicians' communication, the entire medical consultation was videotaped. At the end of the consultation, parents completed a questionnaire assessing their

recall and comprehension of information delivered by the physician, as well as their satisfaction with the medical visit.

Ethical considerations

The Human Research Ethics Committee of the Canton of Vaud and Canton of Fribourg in Switzerland has given approval for this study.

Instruments and measures

Cognitive Complexity

Physicians' spoken communication was transcribed in order to analyze physicians' speech complexity. The following measures reflect different aspects of semantic and syntactic complexity:

Word and Sentence length: The average word lengths as well as the amount of words per sentence are indicative of complexity in language use (Thornton, MacDonald, & Arnold, 2000). These were calculated for each physician with the software Word Counter, version 2.10.1 for Macintosh OS X (www.supermagnus.com).

Flesh Reading Ease Index: This is a formula that takes into account the average number of words per sentence and the average number of syllables per word, and measures the comprehensibility of spoken and written communication. The obtained scores may range from 0 to 100, higher scores indicating more comprehensible communication. This index was also calculated using the above-mentioned software.

Interruptions

Two raters measured physicians' interrupting behavior. First, the total amount of physicians' interruptions was counted for each medical visit. This measure reached fair interrater reliability ($r = .85$). In a further step, we differentiated between positive and

negative interruptions (Li et al., 2004). Positive interruptions comprised interruptions that asked for clarifications, showed agreement, or asked for assistance ($r = .70$). Negative interruptions attempted at changing the topic, taking the floor of the parent, or at avoiding redundant information ($r = .63$).

Positive Mood

Parents' momentary mood was measured after the medical visit with two items from the Multidimensional Mood Questionnaire (Steyer, Schwenkmezger, & Notz, 1994) asking for parents' positive affect (Right now I feel...content, Right now I feel...good). Each item was rated using a five-point rating scale (ranging from "not at all" to "very much"). The internal consistency of the positive affect was .86.

Satisfaction

We used four items proposed by Roter and Hall (2006) in order to measure parents' satisfaction with the medical visit. Two items assessed satisfaction ratings concerning physicians' interpersonal qualities, and two items measured parents' satisfaction with physicians' information supply. The internal consistency for the patient satisfaction measure reached an alpha of .90.

Recall

20 minutes after the medical visit, parents were asked to fill out a questionnaire containing five questions related to physicians' explanations about the child's illness, and five questions concerning medical instructions for home (see Appendix 1). One medical doctor from the hospital watched the video recordings and rated parental understanding and recall according to the following procedure: For each question, physicians' relevant information was collected and the amount of information summed up to a total sum score. In a second step, the

rater compared whether parents' answers in each area corresponded with the information provided by the physician, and calculated a total sum score for the information recalled correctly. In a final step, based upon this information, the percentage of information recalled was calculated, summed across areas, and used as measure for our analysis.

Analytic strategy

Separate moderation analyses were conducted for each of our models specified in our hypothesis. When not included as interactional effects in our models, we controlled for parents' education, age and native language as covariates. Concerning parents' educational background, higher educated patients seem to better recall medical information, but report less satisfaction with the medical visit (Sitzia & Wood, 1997; Watson & McKinstry, 2009). As for age, older patients have been observed to recall less medical information but report more satisfaction with the medical visit compared to younger patients. We also included parents' native language, because parents less proficient in German or French may experience greater obstacles to communication and may experience less satisfaction with care (Johnson, Saha, Arbelaez, Beach, & Cooper, 2004).

Results

Descriptive information

The length of the medical visit was 11.55 ($SD = 5.44$), on average; it was shorter in the inpatient consultation ($M = 10.43$, $SD = 5.39$) as compared to the outpatient consultation ($M = 15.19$, $SD = 4.94$). Physicians used 9.78 ($SD = 2.85$) words per sentence on average, and the mean word length was about 4.10 ($SD = 0.20$). Values of the Flesch Reading Score averaged 83.88 ($SD = 5.50$), indicating that physicians used fairly understandable language. On average, physicians interrupted 2.32 ($SD = 2.29$) times during the medical visit, and the majority of interruptions were positive ones ($M = 1.77$, $SD = 2.00$). Furthermore, male

physicians interrupted more frequently ($M_{\text{male physicians}} = 3.17$, $SD = 2.55$; $M_{\text{female physicians}} = 2.02$, $SD = 2.14$), and the portion of positive interruptions related to their total interruptions was lower (70.17%) than their female colleagues (80.19%). Parents' understanding and retention of medical information averaged at 72%. Parents' positive-affect level was 7.04 ($SD = 1.95$), and parental satisfaction reached an average of 5.56 ($SD = .54$). Additional descriptive results and intercorrelations of our study variables are displayed in Table 1.

Control variables

Controlling for parents' education, age and native language did not reveal a significant effect on our dependent measures, and are therefore not particularly denoted or discussed.

Hypotheses testing

Speech complexity

Our first hypothesis predicted a negative impact of physicians' speech complexity on parental comprehension and retention of information received during the medical visit. Furthermore, we expected these associations to be moderated by parents' momentary positive affect. Our analysis revealed no significant associations between the average amount of words per sentence ($b = .0008$, *n.s.*) and the average word length ($b = -.71$, *n.s.*) and parents' retention of information. The same was true for the Flesch Reading Ease score ($b = .01$, *n.s.*). Furthermore, parents' positive mood did not have a moderating role between these variables (Table 2).

Secondly, we also expected parents' satisfaction ratings to be negatively impacted by physicians' speech complexity and we assumed these relationships to be moderated by parents' educational level. Results from our regression analysis confirmed our predictions, as parental satisfaction was negatively associated with physicians' average word length ($b = -$

1.17, $p < .10$) and number of words per sentence ($b = -.08$, $p < .05$) and positively associated with physicians' Flesch Reading Ease score ($b = .05$, $p < .05$). Furthermore, probing of our interactions revealed that physicians' speech complexity affected mostly satisfaction ratings of parents' with compulsory and secondary education, but not with tertiary education (Table 3).

Physicians' interrupting behavior

Our third hypothesis aimed at exploring the role of physicians' interrupting behavior on parents' understanding and recall of information as well as satisfaction with the medical interaction. In general, parents understood and retained less information the more the physician interrupted the conversation ($b = -.13$, $p < .05$). Against our expectation, positive interruptions adversely affected parent understanding and recall as well ($b = -.16$, $p < .05$). Probing for interactions showed that the effects of positive interruptions were the more pronounced the lower positive mood parents experienced (Table 4). We found the same pattern for physicians' negative interruptions, but these effects did not reach statistical significance probably due to lower power (Table 4).

As for parents' satisfaction with the medical visit, parents reported the less satisfaction the more the physician interrupted the conversation ($b = -.12$, $p < .05$), and this effect occurred irrespective of whether the interruptions were positive ($b = -.11$, $p < .05$) or negative ($b = -.39$, $p < .05$). In contrast to our expectation, exploring the role of physicians' gender revealed that these negative effects were predominantly present for interruptions employed by male physicians (Table 5). For female physicians, only negative interruptions were negatively related with parental satisfaction (Table 5).

Discussion

In this study, we focused on physicians' communication behaviors that are susceptible to influence parental outcomes during and after the medical visit. To do this, we analyzed medical interactions occurring in the pediatric context, and examined how physicians' speech complexity and interrupting behavior is associated with parents' recall of medical information and their satisfaction with the medical visit. In our sample, physicians' complex language was not associated with parents' recall of medical information, but was negatively related to parents' satisfaction ratings particularly in those parents with lower education. Furthermore, parents' reporting low positive mood showed less recall of medical information in relationship with physicians' interrupting behavior. Ultimately, we found that physicians' interrupting behavior negatively affected parental satisfaction with the medical visit, and this applies to positive as well as to negative interruptions. Furthermore, this negative effect on parental satisfaction was mainly significant for male physicians.

Our first hypothesis claimed physicians' complex language to negatively affect parents' recall of medical information, and parents' mood to modulate this effect. Contrary to our predictions, we neither found an effect on parents' recall, nor a moderating role of parents' positive affect. There are several explanations for this finding. In our sample, we observed that physicians' predominantly used readily understandable language, and such a potential restriction of range would make it less likely for an effect to occur. Comparatively, Wittenberg-Lyles et al. (2013) reported similar values for the Flesch Reading Ease Score, and lower values were found in the study of Roter, Erby, Larson and Ellington (2007), but both studies show greater score variability. Furthermore, specific characteristics of the pediatric visit that may interplay with parental understanding have not been considered and included in our model. For example, additional individuals participating at the conversation may foster parental comprehension (e.g. spouses or family members, additional physicians or nurses), or

background noise making parents' understanding more difficult (e.g. children's spontaneous utterances, weeping, background discussions of patients in the same room).

Whereas we did not find an effect of physicians' speech complexity, our analysis evidenced that physicians' interrupting behavior did negatively affect parents' recall of medical information. Furthermore, this relationship was moderated by parents' positive mood state, in the form of a decrease in recall for parents reporting lower positive mood. We found the same pattern for positive and negative interruptions, even though our effects for negative interruptions did not reach statistical significance probably due to lower power. These findings provide insight about the impact of physicians' interrupting behavior on patients' recall during medical interactions. On one hand, our results demonstrate the inhibiting nature of overall interruptions on recall particularly for parents that seem to experience more stress and anxiety during the medical visit. On the other hand, we expected positive interruptions to favor parental recall, as we hypothesized such interruptions to be supportive, allowing more clarifications and more patient tailored information to occur during the medical visit. Our results show the opposite effect and therefore do not confirm the theorized benefits of positive interruptions, at least concerning patients' recall of medical information (Li et al., 2004). Stress and anxiety are known to impair comprehension and recall during medical visits, and research has shown that additional task demands decrease cognitive performance in individuals reporting elevated anxiety (Eysenck, Derakshan, Santos, & Calvo, 2007). Interacting with the physician and following the conversational flow already is a challenging task for parents and, irrespective of their nature, interruptions may represent such supplemental demands that strain parents' cognitive resources and consequently decrease their cognitive performance.

With regard to satisfaction, we found parents to be the less satisfied the more the physician used complex language during the medical visit. Furthermore, this relationship was moderated by parental education, concerning especially parents with compulsory education

and to a lesser extent parents with secondary education. It has been observed that lowly educated patients show less proactive behavior compared to patients with higher educational background (Waitzkin, 1985). Consequently, physicians tend to make less effort with low educated patients or parents, because they fail to recognize their unexpressed needs and do not adjust their communication sufficiently (Roter & Hall, 2006). Thus, although physicians' speech complexity did not affect their recall of medical information, parents with lower education seem to pay special attention to physicians' communication behavior, and appreciate less if the physician does not make an effort to talk in a clear and comprehensible way.

Finally, we investigated to what extent physicians' interrupting behavior is associated with parental satisfaction after the medical visit. We expected physicians' overall interrupting behavior to negatively affect parents' satisfaction, and this was confirmed in our sample. In contrast to our assumption, our moderation analysis evidenced that these negative effects were more pronounced in male physicians. These findings are partially in accordance with the study of Hall, Irish, Roter, Ehrlich and Miller (1994), who in addition found that female physicians had positive and negative effects on satisfaction depending on patients' gender. Our sample consisting mainly of female parents may explain this one-sided effect. Looking closer at positive and negative interruptions, we further found that both negatively affected parental satisfaction when performed by male physicians. For female physicians, we only found an adverse effect concerning negative interruptions, and this effect was weaker. Thus, our findings concerning negative interruptions support current opinions about the negative effect of dominance-related behaviors (Schmid Mast et al., 2011). In our study, however, we found a stronger effect for male physicians compared to their female colleagues. Female physicians are known to behave in a more patient-centered manner compared to male physicians (Roter, Hall, & Aoki, 2002), and thus, parents may have perceived these negative interruptions as less dominant in our sample, especially when occurring in female physician -

female parent dyads (Hall et al., 1994). With regard to positive interruptions, we expected positive associations with parental satisfaction, but we only found a negative effect for male physicians. One explanation for this finding could be that albeit their positive intention, the way male physicians exhibited such interruptions were perceived as unsupportive and rather undermine parents' poor communication behavior. Otherwise, the fact that we did not find an effect for female physicians' positive interruptions may arise from the fact that these have differential effects depending on patients' gender (Hall et al., 1994).

Strengths, limitations, and future directions

To the best of our knowledge, this study is the first to examine the relationship between physicians' speech complexity and interrupting behavior, and parental recall and satisfaction in the pediatric context. Conducting our study with real patients and parents represents a considerable advantage concerning the external validity of our findings. Another advantage is the inclusion of moderators, allowing for a more differentiated perspective on the associations between physicians' communication behavior and parental outcomes. Several limitations need to be acknowledged, as well. First, our study design is correlational in nature and does not allow drawing causal inferences. Second, the use of a video camera during the medical visit may foster reactivity in physicians and parents. Even if several studies evidenced no change in physician and patient behavior due to camera-aided observations (Pearce, Arnold, Phillips, & Dwan, 2010; Penner et al., 2007; Roter & Hall, 2006), this cannot be excluded in our study.

In closing, experimental designs will be needed in the future in order to test for causal effects between physicians' speech complexity and interruptions and parental recall and satisfaction. Furthermore, our study design did not allow conducting follow up measurements with parents, thus we only assessed parents' short-term recall of medical information. Given the important implications on parents' compliance and adherence, we suggest exploring

effects on long-term recall as well. Ultimately, our measure for verbal complexity did not seem conclusive for parents' recall of medical information. Alternative measures of and methods to assess verbal complexity should be considered in the future as well.

Conclusion

In this study, parents' recall of medical information appears to be affected by physicians' interrupting behavior, especially for parents experiencing more anxiety and stress. Furthermore, lower educated parents seem to give special attention to physicians' verbal communication, and report less satisfaction when the physician employs more complex language. Ultimately, parents appreciate less being interrupted by male physicians during the medical conversation. Overall, these findings emphasize the importance of physicians' communication behavior in the pediatric context, and recommend that physicians employ comprehensible language when talking with parents. Furthermore, physicians should interrupt rarely during the medical encounter, and if they do, then with positive involvement.

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Table 1
Means, standard deviations and intercorrelations of study variables

	Mean (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Physician's Gender		1													
0 = Male Physician	26.5%		.07	.07	-.05	.04	.22*	-.11	-.40**	-.22*	-.13	-.22*	-.19	-.05	-.06
1 = Female Physician	73.5%														
2. Parent Age	33.47 (5.29)		1												
Mother	32.52 (4.74)			-.39**	-.17	-.25*	.17	-.05	-.06	.02	.04	-.04	.05	-.01	-.08
Father	37.92 (5.66)														
3. Parent Sex				1											
0 = father	17.6%				.03	-.10	-.01	.01	-.03	-.22*	-.16	-.05	-.18	-.05	.05
1 = mother	82.4%														
4. Parent Native Language					1										
0 = German	11.8%					-.33**	-.02	-.19	-.09	-.07	-.04	-.15	-.10	-.10	-.02
1 = French	54.4%														
2 = Other	33.8%														
5. Parent Education						1									
0 = primary education	27.9%						-.06	.17	-.04	-.03	-.05	.11	-.02	-.16	-.01
1 = secondary education	42.6%														
2 = tertiary education	29.4%														
6. Physician's Flesch Reading Score	83.88 (5.50)						1		-.70**	-.73*	-.20*	-.13	-.23*	.08	.19
7. Physician's Words per Sentence	9.78 (2.85)							1	.33**	.13	.04	.34**	-.05	-.22*	.12
8. Physician's Word Length	4.10 (0.20)								1	.38**	.30**	.27*	.09	-.07	-.05
9. Physician's Total interruptions	2.32 (2.29)									1	.93**	.34**	.02	-.14	-.14
Male Physician	3.17 (2.55)														
Female Physician	2.02 (2.14)														
10. Physician's Positive interruptions	1.77 (2.00)										1	.07	.01	-.08	-.17
Male Physician	2.22 (2.41)														
Female Physician	1.61 (1.83)														
11. Physician's Negative interruptions	0.43 (0.65)											1	-.06	-.34**	.008
Male Physician	0.67 (0.76)														
Female Physician	0.34 (0.59)														
12. Parent's positive mood	7.04 (1.95)												1	.43**	-.07
13. Parent's satisfaction	5.56 (.54)													1	.05
14. Parent's recall	.72 (0.28)														1

Table 2

Conditional effects of physician's speech complexity on parent's understanding by parental mood

	<i>b</i>	<i>p</i> -value	LLCI	ULCI
4. Flesch reading score	.01	<i>p</i> = .54	-.3344	.7533
Low positive mood	.0003	<i>p</i> = .96	-.0157	.0163
High positive mood	-.009	<i>p</i> = .34	-.0304	.0107
5. Words per sentence	.0008	<i>p</i> = .98	-.1001	.1016
Low positive mood	.009	<i>p</i> = .64	-.0289	.0469
High positive mood	.01	<i>p</i> = .39	-.0198	.0504
6. Word length	-.71	<i>p</i> = .18	-1.7660	.3420
Low positive mood	-.22	<i>p</i> = .29	-.6551	.2001
High positive mood	.14	<i>p</i> = .54	-.3270	.6140

Table 3

Conditional effects of physician's speech complexity on parent's satisfaction ratings by parental education

	<i>b</i>	<i>p</i> -value	LLCI	ULCI
1. Flesch reading score	.05	$p < .05$.0181	.1042
Compulsory education	.05	$p < .05$.0161	.0840
Secondary education	.02	$p < .05$.0050	.0463
Tertiary education	.001	$p = .93$	-.0231	.0255
2. Words per sentence	-.08	$p < .05$	-.1564	-.0163
Compulsory education	-.07	$p < .05$	-.1383	-.0164
Secondary education	-.04	$p = .05$	-.0864	.0073
Tertiary education	-.01	$p = .57$	-.0648	.0321
3. Word length	-1.17	$p = .07$	-2.2800	-.0759
Compulsory education	-.94	$p = .08$	-1.8511	-.0382
Secondary education	-.15	$p = .63$	-.6877	.3844
Tertiary education	.64	$p = .28$	-.3535	1.6362

Table 4

Conditional effects of physician's interruptions on parent's recall by parent's positive mood

	<i>b</i>	<i>p</i> -value	LLCI	ULCI
1. Total interruptions	-.13	$p < .05$	-.2365	-.0268
Low positive mood	-.04	$p < .05$	-.0895	-.0077
High positive mood	-.01	$p = .47$	-.0265	.0565
2. Positive interruptions	-.16	$p < .05$	-.3001	-.0351
Low positive mood	-.06	$p < .05$	-.1208	-.0162
High positive mood	.007	$p = .74$	-.0380	.0528
5. Negative interruptions	-.27	$p = .10$	-.6101	.0565
Low positive mood	-.05	$p = .35$	-.1864	.0688
High positive mood	.10	$p = .11$	-.0536	.2698

Table 5

Conditional effects of physician's interruptions on parent's satisfaction ratings by physician's gender

	<i>b</i>	<i>p</i> -value	LLCI	ULCI
1. Total interruptions	-.12	$p < .05$	-.2244	-.0218
Male physician	-.12	$p < .05$	-.2244	-.0218
Female physician	-.004	$p = .89$	-.0769	.0671
2. Positive interruptions	-.11	$p < .05$	-.2219	-.0056
Male physician	-.11	$p < .05$	-.2219	-.0056
Female physician	.02	$p = .62$	-.0632	.1048
5. Negative interruptions	-.39	$p < .05$	-.7231	-.0704
Male physician	-.39	$p < .05$	-.7231	-.0704
Female physician	-.29	$p < .05$	-.5441	.0408

Appendix 1

What did the doctor tell you?

1. What is the illness of your child?
2. Why is your child sick?
3. Which medication does your child need?
4. Which examinations need to be done?
5. When can your child return home?

In case your child may soon return home:

6. Which medication does your child need at home?
7. How many times per day?
8. For how long?
9. When does your child need to be seen again by the doctor?
10. When does your child may return to school/kindergarten?

3. Summary and integration

The health of family members, especially children, is an important value and maintaining it is a goal for parents (Bowling, 1994) that guides their behavior (Carver & Scheier, 1999). The illness of a child puts this goal at stake, and is a disruptive event that raises concerns both in the child and parents (Jessee et al., 2001), affects day-to-day functioning (Carver & Scheier, 1999), and interferes with domains relating to home, work and social relationships (Moskowitz, Shmueli Blumberg, Acree, & Folkman, 2012). For parents, the challenges resulting from the illness itself as well as from the associated burden of care may be stressful. By depleting resources and impairing self-regulatory capacities, it may have implications for parental health and well-being as well. In order to cope with these demands, extra effort is required from parents and they need to rely on external resources as well.

With this in mind, the encounter with the physician is an important event that may constitute both, a stressor and an external resource. Physicians' effective communication behavior may foster positive changes in parents, which in turn may contribute to long-term outcomes that not only benefit the child's well-being, but parents' self-regulatory capacities as well. The purpose of this dissertation, therefore, was to shed some insight into the physician-parent relationship occurring in the pediatric context, and to investigate the impact of physicians' communication behaviors on parental proximal outcomes. To do this, medical encounters occurring between physicians and parents during outpatient and inpatient consultations were videotaped and content-analyzed.

Paper 1 investigated to what extent the medical encounter represented an event stressful enough for parents to elicit a bodily stress response in form of heightened cortisol. Furthermore, the study tested whether physicians' affective communication behavior (e.g. verbal statements, positive atmosphere, and nonverbal behavior) were supportive during the medical visit and related to parents' change in cortisol levels. The findings evidenced the stressful character of the medical interaction for the parents reflected in an important increase in their cortisol response occurring during the visit. Most importantly, physicians' affective communication behaviors were effective in attenuating this stress response.

In Paper 2, I was interested to see if physicians' negative word use correlated negatively with parents' positive affect and satisfaction ratings. Furthermore, the mediating

role of parents' positive affect regarding the relationship between physicians' negative word use and parents' satisfaction after the medical visit was investigated. Although there was no direct effect on parents' satisfaction, physicians' negative word use indirectly affected parent's satisfaction via a decrease in parents' positive mood.

In Paper 3, the relationship of physicians' speech complexity, (operationalized through semantic and syntactic characteristics) as well as physicians' interrupting behavior (positive and negative interruptions) with parents' satisfaction and their retention of medical information was analyzed. Parental characteristics (positive mood and level of education) as well as physician characteristics (gender) were included to test their moderating role between the examined relationships. Parents with lower education reported less satisfaction the more the physician used complex speech during the interaction, but no association was found with their recall of medical information received during the visit. Physicians' interruptions, positive and negative, were associated with a decrease in recall of parents reporting low mood, and affected parents' satisfaction with the medical visit mainly when displayed by male physicians.

3.1.The medical interview as stressful event

The importance of the medical visit for parents has been stressed in the introductory section of this thesis. The child's illness represents a major threat for the child and parents, and they rely on physicians' competence and expertise to receive information about the diagnosis, prognosis, and adequate treatment plan. Thus, parents hope to receive comforting and promising information that allows a positive appraisal of the situation. Besides nurturing such positive expectations, the medical interview may also be anticipated with apprehension (Jessee et al., 2001), as parents are uncertain about the outcome of the medical visit. Paper 1 evidenced increased adrenocortical activity in parents, suggesting that the encounter with the physician represented a source of psychological stress. This finding fills a gap in this domain, as research has been scarce so far, and the only study from Finset et al. (2006) with patients participating in arranged consultations showed no adrenocortical reactivity. For parents dealing already with the demands of the child's illness and associated care, the medical encounter is an additional stressor that physicians should not underestimate.

In general, cortisol reactivity is associated with situations or events representing a threat to or impeding personal goals (Dickerson & Kemeny, 2004; Hoppmann & Klumb, 2006). Such a response is necessary when an individual is faced with threat, as it helps the body adapt to increased demands placed on the organism (Dickerson & Kemeny, 2004). However, when the organism is exposed to prolonged cortisol activity, this may favor negative physical and mental health outcomes (Miller, Chen, & Zhou, 2007). To this effect, we only measured parents' cortisol in the course of the medical visit. Thus, we do not know if they experienced heightened cortisol levels already upon arrival. Important changes in cortisol patterns have been observed in parents with chronically or severely ill or handicapped children (e.g., Miller et al., 2002), but no data are available for parents where the child's illness is curable or less severe. This is surely an avenue for future research, as this may have important implications for parental health in the long term, and may imply preventive measures from health care professionals.

3.2. Physicians' affective communication behavior

Although physicians are cannot control how parents perceive the medical encounter, they can influence the course of the medical visit and act as a buffer against parents' stress through their communication behavior. This is demonstrated with a further finding of Paper 1. Physicians' affective communication behavior, displayed by a warm and friendly atmosphere as well as empathic, reassuring statements and nonverbal behavior, is effective in attenuating parents' endocrine stress response during the medical visit. Thus, physicians' affective communication behavior may act as emotional support for parents, leading them to reappraise the situation as less threatening and more controllable (Cohen & Wills, 1985). This not only allows a reduction in their immediate arousal, but may also increase parents' self-efficacy by enabling their adaptive capabilities to face challenging situations in the future (Schwarzer & Knoll, 2007).

This finding is of special relevance in the pediatric context, as parental concerns seem to be discounted in favor of the child's needs (Turner, Chur-Hansen, & Winefield, 2014). In general, supportive behaviors account for only a minor portion of medical consultations (Street & Millay, 2001), especially emotionally supportive behaviors (Bradford et al., 2012). Distinctive patterns of communication have also been observed in physicians when addressing the child or the parent during the medical encounter. When physicians talk to

children, this mainly consists in affective behaviors like social and joking utterances, whereas communication directed toward parents is mainly instrumental in communicating facts (Tates & Meeuwesen, 2001). During a child's illness, one of parents' greatest unmet needs is social support (Levetown, 2008), and much importance is given to physicians' supportive communication behaviors during the medical visit (Bradford et al., 2012; Coulson et al., 2007). Thus, this finding suggests that physicians may want to pay more attention to their affective communication behaviors, as these are important for parents and beneficial to lower their stress levels due to the interaction with the physician.

Ultimately, numerous studies evidence the positive relationship between the perceived availability of social support and subjective and psychological well-being (Lakey & Orehek, 2011; Schwarzer & Knoll, 2007; Skok, Harvey, & Reddihough, 2006; Thoits, 1995, 2011). Thus, in the long term, simply knowing that the physician may act as a resource in times of distress may be beneficial for parents, because already the availability of social support has been shown to be a strong predictor of well-being (Cohen & Wills, 1985; Uchino & Garvey, 1997).

3.3. Physicians' negative word use

The objective of my second research question was to investigate to what extent physicians' way of transmitting information would affect parents' positive affect and satisfaction after the medical visit. In Paper 2, I took a closer look at the negative words physicians used during the medical visit, and these did negatively affect parents' positive affect. Furthermore, an indirect effect on parents' satisfaction was mediated via a decrease in parents' positive affect.

These findings are relevant for several reasons. First, parents were reactive to physicians' negative word use in a similar way as that reported in previous studies investigating patients undergoing medical procedures (Häuser, Hansen, & Enck, 2012), and this could be suggestive of their high emotional involvement when interacting with physicians. Along the emotional burden related to the child's illness, the medical encounter is an additional source of stress making parents more susceptible to the negative elements of physicians' communication. Second, focusing on positive emotions is a new perspective for research on health-care communication. In fact, interpersonal health communication is not

committed to elicit positive emotions in patients, even if these benefit an individual's health (Ellington, Kelly, Reblin, Latimer, & Roter, 2011). In view of the distressing nature of illnesses, research has rather focused on decreasing associated negative emotions (e.g. Fogarty et al., 1999), the function of which is motivating life-preserving actions (Fredrickson, 1998). In contrast, fostering positive emotions in patients and parents has beneficial short and long-term effects on well-being and health. Positive emotions have the capacity to undo the aftereffects of negative emotions and help build enduring personal resources that an individual can rely on for adverse situations occurring in the future (Fredrickson, 2000). Furthermore, parents have to face higher stress-levels with increase fluctuations in positive and negative mood states (Röcke & Smith, 2009). Positive emotions may function as a resource in face of adversity and stress, because regulating such fluctuations in emotions may tax their self-regulatory capacities (Ryan & Deci, 2008; Tice, Baumeister, Shmueli, Muraven, 2007). It is therefore important that physicians employ communication behaviors that foster positive emotions in patients, and actively engage in assisting their affect-regulation (Finset & Mjaaland, 2009).

In addition, Paper 2 evidenced that differences in parents' positive affect did account for variations in parent's satisfaction ratings. This finding contributes to our knowledge about the individual characteristics that account for satisfaction ratings in health care (Gill & White, 2009; Hekkert, Cihangir, Kleefstra, van den Berg, & Kool, 2009). Furthermore, physicians' negative word use did explain variance in mood in addition to individual differences, and this communication-related change in mood affected parents' satisfaction ratings. These findings show the importance of parents' subjective experience during the medical encounter, and that physicians' way of talking with parents does affect their satisfaction, ultimately.

3.4. Physicians' speech complexity and interrupting behavior

Concerning parents' satisfaction with the medical visit, Paper 2 already evidenced the affective basis that underlines parental evaluations of the encounter with the physician, and the associated influence of physicians' negative word use. In Paper 3, I further investigated physicians' speech complexity and interrupting behavior in relationship with parents' satisfaction. The findings yield further knowledge regarding the communication behaviors that are susceptible to affect parental satisfaction with the medical visit. Physicians who make an effort to communicate in a clear and comprehensible way seem to be appreciated by

parents, especially by those with low education levels. Parents expect to receive information in a clear and comprehensible way (Hallström et al., 2002; Levetown, 2008), and when physicians employ language that is easy to understand, parent's satisfaction increases, as their needs are respected and they have a better understanding of the information received. This is consistent with findings that associate affiliative behaviors with positive patient outcomes (Kiesler & Auerbach, 2003). Furthermore, this finding challenges physicians to pay special attention to the way they talk with parents and to be attentive to parental characteristics. This seems especially to be the case with less educated parents, as physicians may fail to recognize the needs of this social group and do not adjust their communication sufficiently (Roter & Hall, 2006).

The findings of Paper 3 evidence as well the negative impact that physicians' interrupting behaviors have on parents' satisfaction, irrespective of whether these were positive or negative. These effects were more pronounced in male physicians, and are consistent with past research findings suggesting that male physicians generally behave in a less patient-centered manner compared to their female colleagues (Roter, Hall, & Aoki, 2002). This may also explain the negative evaluation of their positive interruptions during the medical encounter. Furthermore, these findings confirm the negative effects of dominance-related behaviors on patient outcomes (Schmid Mast et al., 2011). For female physicians, only negative interruptions were adversely related to parental satisfaction, and this can be explained by the differential impact female physicians have on patients' depending on their gender (Hall et al., 1994). A replication with a larger sample size investigating different gender combinations would be needed to clarify this question.

Further, Paper 3 investigated the influence of physicians' speech complexity and interrupting behavior on parents' recall of medical information. Whereas no effect was found concerning physicians' speech complexity, physicians' interruptions, irrespective of their quality, were negatively related to parents' recall of medical information. Moderation analysis furthermore revealed that this was especially relevant for parents reporting low positive mood. Interacting with the physician is a challenging and stressful task for parents, and, irrespective of their nature, interruptions may represent supplemental demands on parents' cognitive resources and consequently decrease their cognitive performance (Eysenck, Derakshan, Santos & Calvo, 2007).

With regards to physicians' interruptions, the above-mentioned findings question the positive properties of supportive interruptions proposed by Li et al. (2004). Our findings only evidenced negative effects moderated by patients' and physicians' properties. Further research is needed to get a clearer picture, as the influence on patient outcomes may be more complex than assumed and interplay with patient as well as physician characteristics. For example, Li (2001) found that collectivistic cultures prefer cooperative interruption styles compared to individualistic cultures. Thus, patient preferences concerning physicians' interrupting behavior may also be culture specific.

Overall, our findings show that physicians' speech complexity and interrupting behaviors do influence parental satisfaction and recall of medical information. As discussed in the introduction of this thesis, these outcomes are beneficial for both the child and the parent (Hekkert et al., 2009; Hills & Kitchen, 2007; Jackson, Chamberlin, & Kroenke, 2001). Recalling the information provided by the physician is a prerequisite for parents to follow the treatment advice at home, and consequently increases their adherence and compliance. The same applies for parental satisfaction. Parents reporting higher satisfaction are more likely to comply and adhere to the medical treatment as opposed to unsatisfied parents. This, in turn, contributes to the improvement of the child's health and recovery. Parents, therefore, engage towards goal-progress in an active way, and this, in turn, is positively related to their emotional experiences (Cameron & Leventhal, 2003; Wrosch et al., 2012).

3.5. Practical implications

Our findings show the necessity for physicians to be aware of communication behaviors that foster positive patient outcomes during the medical encounter. From our findings, several practical conclusions can be drawn for physicians' daily communication with parents.

Although the beneficial effects of physicians' affective communication behaviors have been acknowledged, these seem to be adopted poorly during the medical encounter, including in pediatric contexts (Bradford, et al., 2012; Tates & Meeuwesen, 2001). One explication may be that parents and patients rarely express their concerns and emotions, which makes it difficult for physicians to detect distress in parents (Bensing et al., 2008; Hart et al., 2007). Considering that the medical encounter itself is a stressful situation for parents,

as evidenced in Paper 1, it is important that physicians be aware of the goals that are at stake for parents when they come to the consultation. Thus, physicians may want to make an extra effort to identify distress in parents and engage more in affective communication behaviors. Furthermore, a trusting and supportive attitude may help parents disclose stressful issues during the encounter, which helps physicians to adapt their communication behavior accordingly.

Not only the content of physicians' communication is important during the medical encounter, but also how it is conveyed. Based on the finding of Paper 2, I stress the importance of avoiding words with negative connotations, as these were negatively related to parents' affective experience and evaluation of the medical visit. This does not mean that physicians have to change their message or acquire new vocabulary, but simply acquiring a routine of choosing words that are rather neutral or of positive valence may already be sufficient to foster positive affect in parents, and their satisfaction, ultimately.

Furthermore, physicians should employ comprehensible language when talking with parents or patients. Even if these recommendations have been addressed in the past, few improvements seem to be made (Arora, 2003). Rather, physicians tend to overestimate their communication abilities and often do not employ communication techniques that facilitate patient comprehension (Howard et al., 2013; Silberman, Tentler, Ramgopal, & Epstein, 2008). Adopting a clear and comprehensible language seems to be especially important for parents with less education. This requires to pay special attention to the personal characteristics of the parents encountered in the medical practice and to adjust one's language consequently.

Another important implication for physicians regards the use of interruptions during the medical conversation. The findings of Paper 3 suggest that interruptions should be avoided, irrespective of their positive or negative nature. This is because they may additionally tax cognitive resources in parents and negatively affect parents' recall of medical information. Furthermore, these may be perceived as dominant behavior and decrease parental satisfaction, especially when employed by male physicians. Further research is needed in order suggest recommendations for female physicians. In general, if interruptions cannot be avoided, these should rather be positive in nature.

These practical implications are not only relevant for physicians' daily interactions with patients, but also important for training physicians' communication skills. A major critique concerning communication skills training in the health care context relates to the low specificity of communication skills taught and reported in intervention studies (Berkhof, van Rijssen, Schellart, Anema, & van der Beek, 2011; Cegala & Lenzmeier Broz, 2002). With the findings of this thesis, specific communication behaviors have been linked with important parental outcomes, and may be included into communication skills training for physicians. Affective communication behaviors have already been implemented in training interventions, including in the pediatric context (Hart et al., 2006), but the other communication behaviors investigated in this thesis have been rarely considered or not at all. Consequently, these are noteworthy and necessary to be included for training.

3.6. Future directions

Application to the patient population

The research findings reported in this dissertation focus on parents coming to the medical visit in the pediatric context. Thus, the application of these findings to the patient population needs to be confirmed in future studies. Previous research suggests that physicians' communication behavior may differently affect patients' outcomes depending on the severity of their illness or personal characteristics. For example, Buller & Buller (1987) reported that physicians' affiliative behavior was more beneficial to patients who were less severely ill compared to patients with severe illness. Trait anxiety seems to play a role as well. Graugaard and Finset (2000) found that patient centered communication was preferred in subjects with low trait anxiety (Graugaard & Finset, 2000).

Experimental designs

The findings presented in this thesis were obtained by conducting an observational field study. Such a design allows measuring clinical behavior in a non-invasive manner, and has the advantage of high external validity. The disadvantage, however, is that this kind of study does not allow drawing causal inferences. Thus, experimental studies are necessary in the future in order to examine causal relationships between physicians' communication behaviors and parental outcomes. Ideally, experimental studies should be conducted in the field, as these prove to be rather rare in health care (Hall, 2003) and would allow drawing

causal relationships and still have high external validity. But such an approach is difficult to realize and may raise ethical questions (Hillen, van Vliet, de Haes, & Smets, 2013).

Otherwise, the influence of physicians' communication can be investigated in the laboratory by experimentally varying behaviors in simulated parent-provider settings. Several methods have been developed and seem promising for conducting experimental research in health care, like for example the use of scripted video vignettes (Hillen et al., 2013) or virtual environment technology (Schmid Mast, Hall, & Roter, 2006).

Parents' self-report measures

Paper 1 evidenced the stressful nature of the medical interview in the form of heightened cortisol secretion in parents, but this does not provide information about the specific elements of the medical visit that were perceived as stressful by the parents. Future studies should therefore integrate self-report measures, asking about the specific stressful features of the medical encounter. Identifying those elements would advance our knowledge about the stressful features that characterize the medical interview, and would be helpful for physicians to adapt their communication behavior consequently. Furthermore, I argued that physicians' affective communication behavior is a form of social and emotional support that is effective in buffering the parental stress response. Future research should therefore include self-report measures asking parents if they perceived the physicians' communication behavior as warm and empathetic, and if they felt supported by this kind of communication. It could be possible that parents are not aware of the physicians' intention to be supportive, although this may still be effective in reducing parents' stress. Research findings suggest that the support received does not depend on the recipient's awareness in order to be effective (Bolger & Amarel, 2007), and it would therefore be interesting to manipulate physicians' support visibility in future studies and to investigate its varying effects on parental stress.

Inclusion of the child

This thesis focused on communication between physicians and parents occurring in the pediatric context, but the study design did not allow to include the child into the analysis. Therefore, the full interactional dynamic that is distinct to the pediatric context is not reflected. Including the child in future research is important for several reasons. First, patient-centered care should value the child's role as important as the parent's, as the child needs to be considered as an intelligent and cooperative patient, having its own cognitive and

emotional needs (Tates & Meeuwesen, 2001). Second, children may contribute in a substantial way to the course of the medical visit, and may provide important information to physicians and parents (Stivers, 2012). The child's participation, however, is age-related, and may differ depending on the illness and needs presented (Tates & Meeuwesen, 2001).

Follow-up measurements

Our study design did not allow conducting follow up measurements with parents, and we only assessed parents' affect and recall of medical information 20 minutes after the medical visit. Given the important implications for parents' compliance with and adherence to the medical treatment, I suggest exploring effects on their long-term recall as well. In fact, patients' recall of medical information is rather high when measured right after the medical encounter. When asking days or weeks after the medical visit, patient recall rates may be much lower. Thus, measuring parents' recall of medical information on a day other than the day of consultation may give supplemental insight into the impact of physicians' communication behavior on long-term recall. Furthermore, monitoring parents' affective well-being days or weeks after the encounter may increase our knowledge of how physicians' communication behavior may influence parents' emotion regulation in the long-term.

3.7. Conclusion

I started the introduction of my thesis comparing physicians' medical practice with jazz music, implying that physicians should be skilled improvisers who engage in communicative acts that not only reflect evidence-based practice, but also adapt to the uniqueness and individual needs of the patient. With the research questions articulated and the related findings discussed in this thesis, I tried to contribute to the knowledge on communicative competences physicians need to be aware of and employ in their medical practice. Specifically, I have focused on physicians' communication behaviors in the pediatric context, as this domain has received less attention in health care communication research.

In particular, physicians need to realize that parents have specific needs related to the illness of their child. Parents come to the medical visit not knowing what the physician is going to tell them concerning the illness-related diagnosis, treatment or prognosis, rendering the medical encounter unpleasant and stressful for them. This requires of physicians to identify parents' distress and to allow them to express their concerns and expectations without being interrupted. In this regard, adopting supportive communication behaviors

alleviates parental concerns and apprehensions. Furthermore, if physicians make an effort to employ a clear and comprehensible language, they respect parents' need for information that they are able to understand. In addition, if physicians manage to transmit their overall communication while avoiding negative words, this will enhance parents' well-being and satisfaction as well.

In conclusion, although there may be many aspects that physicians do not control in their profession, their communication behavior is one important aspect they can master. Only then the relationship between physician and patient will resemble a good piece of jazz.

4. References

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5. Curriculum Vitae

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Education

- 09/2010 – today: DAS - Diplôme en Enseignement Supérieur et Technologie de l'Education (University of Fribourg, CH)
- 04/2009 – 03/2015: Ph.D. Student, Supervisor: Prof. Dr. Petra L. Klumb (University of Fribourg, CH)
- 10/2001 – 03/2009: Student in Psychology: Work & Organizational Psychology (Major), General Psychology (Minor) & Hebrew Language and Culture (Minor) (University of Fribourg, CH)
- 08/1989 – 06/1998: Abitur, Ursulinen Gymnasium Mannheim (D)

Professional Experience

- 11/2011 – today: University of Fribourg (CH): Supervisor of Internships, Department of Psychology
- 04/2009 – 04/2014: University of Fribourg (CH): Assistant to the Chair, Personnel & Organizational Psychology (Prof. Dr. Petra L. Klumb)
- 08/2008 – 03/2009: University of Fribourg (CH): Student Assistant, Chair of Personnel & Organizational Psychology (Prof. Dr. Petra L. Klumb)
- 03/2005 – 03/2006: Medair, Ecublens (CH): Internship Human Resources

Publications

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Gemmiti, M., Hamed, S., Lauber-Biason, A., Wildhaber, J., Pharisa, C., & Klumb, P. L.

(2016). Physicians' affective communication behavior attenuates parents' stress response during the medical interview. *Patient Education and Counseling*. Advance online publication. doi: 10.1016/j.pec.2016.09.006.

Gemmiti, M., Hamed, S., Wildhaber, J., Pharisa, C., & Klumb, P. L. (in press). Pediatric Consultations: Negative-Word Use and Parent Satisfaction. *Journal of Pediatric Psychology*.

Ehrenwörtliche Erklärung

"Ich erkläre ehrenwörtlich, dass ich meine Dissertation selbständig und ohne unzulässige fremde Hilfe verfasst habe und sie noch keiner anderen Fakultät vorgelegt habe."